

PROSPECTUS

MASTER OF SCIENCE
IN
MEDICAL TOXICOLOGY
2011



**SPECIALTY BOARD IN MEDICAL TOXICOLOGY
BOARD OF STUDY IN
MULTIDISCIPLINARY STUDY COURSES
POST GRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO**



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SPECIALTY BOARD IN MEDICAL TOXICOLOGY

BOARD OF STUDY IN MULTIDISCIPLINARY STUDY COURSES

1. NAME OF THE DEGREE PROGRAMME:

Master of Science in Medical Toxicology

2. FULL TITLE:

Master of Science in Medical Toxicology

3. ABBREVIATED TITLE:

M.Sc. Med. Tox.

4. BACKGROUND TO THE PROGRAMME:

Self poisoning and snake bites are major clinical problems in the developing world. In some countries, the field of medical toxicology has developed into a sub specialty while in the developing world, where medical toxicology is more relevant, the training is limited to few lectures at undergraduate level. At present, medical toxicology is rapidly expanding field of science which epitomizes the need to continuously update the knowledge of practicing doctors in these countries.

Recognizing the need for a program to improve the knowledge, attitude and practice of medical toxicology in the developing world, the Speciliaty Board in Medical Toxicology under the patronage of Board of Study in Multidisciplinary Study Courses will conduct the training program and the examinations leading to the Master of Science degree in 12

5. JUSTIFICATION:

Although medical toxicology and toxinology has developed into a speciality within the medical sciences in most of the developed countries, the undergraduate curriculum in Sri Lanka does not allocate much emphasize towards medical toxicology due to obvious reasons. This has lead to less than optimal knowledge on toxicology related matters among the medical professionals of Sri Lanka and is having a negative impact on the patient care and on the amount of quality research output in relation to toxicology. Thus, the MSc in Medical Toxicology would be the stepping stone in the direction of recognizing the importance of this subject stream and would aim to bridge the gap between undergraduate training and practicing of evidence based medicine in matters related to toxicology and toxinology, which would evolve exponentially with the advancement of sciences and technology in the years to come.

POTENTIAL BENEFITS

Acquisition of this MSc is considered useful to:

1. Improve the knowledge in relation to medical toxicology and toxinology.
2. Qualify the participants for promotion to grade 1 medical officers in the Ministry of Health
3. Improve research output in the fields of toxicology and toxinology

6. COURSE OBJECTIVES:

- Develop an understanding of the mechanism of toxicity
- Impart knowledge in relation to managing specific conditions related to toxicology and toxinology.
- Understand the broader social and regulatory context in relation to toxicology

- Develop the ability to critically appraise medical literature and evidence in the practice of toxicology and toxinology.
- Form the basic knowledge in order to facilitate further learning in the field of clinical toxicology.
- Inculcate self directed learning and evidence based practices among the trainees.

7. ELIGIBILITY REQUIREMENTS:

The candidate shall have a medical degree registrable with the Sri Lanka Medical Council and one year of clinical experience after internship. In the case of non-resident applicants, they shall have a medical degree registrable with the Medical Council or equivalent statutory body in their country of qualification and one year of clinical experience after internship.

The candidates are expected to be competent in basic computer skills and should be able to organize facilities to participate in the online course. The PGIM will not undertake training of candidates in relation to basic computer skills. A workshop would be held in order to give training necessary to interact with the online learning platform (Moodle).

8. ADMISSION PROCESS:

Candidates shall be selected for training, based on a qualifying entrance examination which consist of 40 Multiple Choice Questions (True / False type) derived from basic pharmacology, basic physiology, basic toxicology and general medicine.

Maximum of 30 candidates among those who obtain more than 50% in the qualifying exam shall be selected for training and maximum of 5 overseas candidates who obtain more than 50% would be accommodated on supernumerary basis.

9. PROGRAMME DURATION:

Two years

10. COURSE SYLLABUS:

The course is a distant learning programme based on an online platform using the Moodle learning management system. Apart from the course work, the trainees are expected to formulate a clinical portfolio by critically analyzing designated number of toxicology related cases in a ward setting recognized and approved by the Speciality Board.

Students have to complete 4 course units designated as ‘core subjects’ and 3 elective course units designated as ‘elective subjects’ in order to sit for the final exam. The Speciality Board would conduct optional face-to-face workshops for the benefit of the trainees but, these would not carry additional credit points. The overall structure of the MSc programme shall be as follows:

Total Credit / time allocations for MSc in Medical Toxicology (MSc-004)				
Unit No.	Name of the Course Unit	Type	Total Duration of online activity	Total Number of credits
MSc-004-01	Core Sciences	Core subjects	12 weeks	12 credits
MSc-004-02	Clinical Toxicology of Chemicals and Metals		20 weeks	20 credits
MSc-004-03	Plants and Animals		15 weeks	15 credits
MSc-004-04	Pharmaceutical Poisoning		16 weeks	16 credits
MSc-004-05	Chemical Disaster	Elective subjects	10 weeks	10 credits
MSc-004-06	Community Health and Environmental Toxicity		10 weeks	10 credits
MSc-004-07	Addiction		10 weeks	10 credits
MSc-004-08	Regulatory Sciences		10 weeks	10 credits
Self Study			-	27 credits
Mid and end of course unit assignments			12 weeks	-
Total Credit and time duration			105 weeks	120 credits

Note:

- Trainees are expected to follow online learning activities equivalent to 15 hours per week on the Moodle platform. Thus, 1 credit allocation is made for the online activities designated for each week.
- Apart from the designated online activities, trainees are also expected to undertake 15 hours of self study through online/ off-line activities per week using related learning material / references. An allocation of 1 credit is made when the students complete 90 hours of self study (4 weeks).
- Total of 12 weeks are allocated for completion and submission of

mid and end of 'course unit' assignments.

- Please refer the **annexure 1** for further details regarding the curriculum.

11. TEACHING / LEARNING METHODS:

The online training would make use of reading materials, video demonstrations, pod casts, online presentations, discussion boards, assignments, quizzes...etc and each course will have several lessons of designated duration that will require the trainees to actively participate and contribute. During the training, the trainees will be grouped and would be assigned the role of a group leader according to a rotation, to lead the discussions which will be based on 'clinical scenarios'.

Tutorial Group Structure

Students (depending upon the numbers) would be allocated into tutorial groups. As each course consists of a series of topics each tutorial session would have rotating members nominated as:

- Discussion leader: This person initiates the discussion by attempting to provide their answers or thoughts
- Discussion reporter: This person would collate the group views towards the end of the tutorial session

Distribution on CD

All core materials would be delivered on a CD / Electronic format

Discussion forums

Responsible tutors will oversee the web based discussion boards which will be initiated by a series of questions from within the course material. (e.g www.wikitox.org). The candidates will be expected to read the reference articles provided and formulate an answer and post it on the web. Each student is expected to comment

and discuss each other's answer and post their own answer. This would not require fast internet connection as the bulk of content is delivered to individuals on a CD or in another electronic format.

Tutors

Tutors would be responsible for a series of topics within a course. Online tutor's major input would be after the discussion reporter's summation. Prior to that, they may offer guidance or supplementary questions.

Optional Face to Face workshops

This would probably take place in conjunction with existing international meetings. These are often already being run as workshops by particular societies. (E.g. Asian, European and American societies of toxicology). It could also include a specific program of workshops if the student numbers justify this.

Zero tolerance for Plagiarism

All academic material submitted for online activities (e.g discussion forums, assignments...etc) would be perused using sophisticated software for acts of plagiarism. In the event of detecting plagiarism, action will be taken according to the degree of the violation and can amount to,

- Instructing on re-submitting the work with appropriate changes
- Calling for explanations with regard to the act of plagiarism
- Reporting to the other relevant bodies dealing with disciplinary matters at the PGIM
- Failing the assessment in which the plagiarized content was intended
- Suspension from the course of study after a disciplinary inquiry according to the PGIM regulations.
- Or any other disciplinary action according to the PGIM regulations as decided by the relevant authorized body.

12. COURSE EVALUATION:

The course evaluation will comprise of three components.

1. Continuous assessment
2. Portfolio assessment
3. Final assessment

Continuous assessment (50% of the final mark):

The total mark given for continuous assessments will be 100 and will include assessments pertaining to,

1. Discussion forums (50% of the continuous assessment) :

Each discussion forum (problems in the online system) will be marked out of 3. The total marks obtained for all discussion forums will be summated and averaged to obtain a mark out of 50. Tutors will be assessing the trainees based on their participation in the discussions by providing rational and adequately referenced answers as well as by their submissions within the deadlines to the discussion forum as the group leader or as the reporter. The total number of discussion can vary from one lesson to another and will be altered depending on the learning needs of the trainees.

2. Mid course unit assignments (25% of the continuous assessment)

There will be total of 4 mid course unit assignments and each assignment will be marked out of 100. The total marks for the mid course unit assignments will be averaged to obtain a mark out of 25. The assignments should be submitted through the online platform during the course before a stipulated deadline.

3. End of course unit assignments (25% of the continuous assessment)

There will be total of 4 end of course unit assignments and each assignment will be marked out of 100. The total marks for the end of course unit assignments will be averaged to obtain a mark out of 25. The assignments should be submitted through the online platform after the particular course before a stipulated deadline.

Portfolio

Each student is expected to compile a portfolio consisting of 8 cases according to the following criteria:

1. Format of the cases: describe each case as it is in terms of resuscitation, decontamination, antidote administration, investigations, in ward care and monitoring, psychiatric assessment and follow up after discharge. Critically evaluate the management citing evidence from literature and discuss optimum management.
2. Each case to be written using a format similar to the Ceylon Medical Journal with a word count of about 3000.
3. Students are expected to visit a medical facility of choice and witness the management of each patient.
4. The trainees should inform the PGIM in advance the name of the consultant and the hospital they intend collecting data from, to facilitate the PGIM to prepare supporting documents.
5. The consultant in-charge of the patient should supervise the case report.

Portfolio structure:

1. The portfolio should contain minimum of eight chapters pertaining to eight different clinical cases relevant to Toxicology and Toxinology. The cases should be real encounters in the hospital ward setting and the trainees are expected to gather relevant data and evidence pertaining to the clinical encounter. These data may be in the form of photographs, audio video recordings, clinical notes, investigative findings, or other information which should be obtained after prior written approval from the relevant authorities as well as from the patients wherever relevant.
2. The discussion of each clinical case should follow the format indicated above in 'format of the cases'.
3. Each chapter should include a reflection on the said experience and a critical evaluation of the management with suggestions for further improvement based on evidence based medicine. Trainees should do appropriate referencing to journal articles wherever possible when such evaluations are made.
4. Final portfolio should include a table of content, a summary at the end of each chapter and a bibliography with appropriate citations made within the portfolio.

Portfolio submission:

Trainees are expected to submit the completed portfolio 3 months before the date of the final exam.

Portfolio assessment:

The portfolio will be assessed at a face to face viva examination using a structured marking scheme (Annexure 2) and the **candidates are expected to obtain 50% or more out of 100 marks to receive a 'pass' grading in order to become eligible to sit the final exam.**

Re-submission of the portfolio:

Students who obtain less than 50% for the portfolio are expected to re-submit the portfolio according to examiner recommendations 1 month before the exam for re-evaluation. Trainees who obtain 50% or more for the re-submitted portfolio would be eligible to sit the final exam.

Final assessment (50% of the final mark):

1. Eligibility to sit the final assessment:

1. Candidate should obtain a minimum of 80% participation for online discussion forums.
2. Should successfully complete the Portfolio and obtained a 'pass' grading.

2. Structure of the final assessment:

The final assessment would consist of Multiple Choice Questions (MCQs) and Structured Essay Questions (SEQs). The total marks available for both components will be 100.

1. 40 MCQs (2 hours)

The MCQs would be of true/false type and would be derived from all 'core subjects'. Each MCQ will carry a mark out of 5 and the total marks available for the MCQ would be 200. The total marks for the MCQs will be averaged to obtain a mark out of 50.

2. 6 SEQ questions (3 hours)

There will be 9 SEQs of which 4 SEQs will be based on 'core subjects' and 5 SEQs will be based on the 5 elective courses. The candidates are expected to answer 6 SEQs including the 4 questions based on the 'core subjects'.

Each SEQ will be marked out of 100 and the total marks obtained for all SEQs will be averaged to obtain a mark out of 50.

SUCCESSFUL CANDIDATE:

A successful candidate would be fulfilling the following criteria:

1. Should successfully complete the Portfolio and obtained a 'pass' grading.
2. Obtain 50% or more from the total mark given for the continuous assessments.
3. Obtain 50% or more from the total mark given for the final assessment.

UNSUCCESSFUL CANDIDATE:

1. A candidate failing to achieve 50% or more in the final assessment and obtain 50% or more for the continuous assessments is eligible to sit for the repeat exam.
2. A candidate failing to achieve 50% or more for the continuous assessments and obtains 50% or more for the final assessment would have to follow the relevant course units as designated by the Speciality Board and attain the stipulated minimum requirements before becoming eligible to consider for receiving the MSc.(The candidates would have to incur the expenses in repeating an online course unit as designated by the PGIM)
3. A candidate failing to obtain 50% or more for both the continuous assessments and for the final assessment would have to repeat the relevant course units as designated by the Speciality Board and would have to sit for the repeat

exam or an exam proper with a junior batch.

4. A candidate becoming ineligible to sit the final assessment due to failure in submitting the portfolio/receiving a 'fail' grade for the portfolio, would have to re-submit the portfolio one month prior to the repeat exam to be assessed prior to the said exam.
5. A candidate becoming ineligible to sit the final assessment due to less than 80% participation in online discussion forums would have to submit one or more assignment(s) designated by the Speciality Board and obtain 'pass' grading(s) (50 marks or more for each assignment) in order to be considered as eligible for sitting the final assessment.

A candidate would be given a maximum of six attempts over a period of 8 years whichever comes first to complete the final assessment from the date of commencing the course.

13. Annexure 1:

Detailed curriculum and credit allocations for MSc in Medical Toxicology

Definition of credit: - 15 hours of online activity per week or 90 hours of self study per week

Required Course Units.

1. Core Sciences (Contain 10 lessons and 2 assignments)

• Lesson 1	Pharmacokinetics and Protein Binding	two weeks	Two credits
• Lesson 2	Clinical Toxicology	two weeks	Two credits
• Lesson 3	Paracetamol Poisoning	one week	One credit
• Lesson 4	Lithium	one week	Two credits
• <u>Mid Module Assignment</u>	Assignment	one week	One credit
• Lesson 5	pH manipulation in Toxicology	one week	One credit
• Lesson 6	Cyclic Antidepressants	one week	One credit
• Lesson 7	Serotonin Receptor Reuptake Inhibitors	one week	One credit
• Lesson 8	Newer Antidepressant Agents	one week	One credit
• Lesson 9	Neuroleptics (Typical or Old)	one week	One credit
• Lesson 10	Hypnotosedatives	one week	One credit
• <u>End of Module Assignment</u>	Assignment	two weeks	Two credits

Total Number of credits = 15

2. Clinical Toxicology of Chemicals and Metals

(Contain 15 lessons and 2 assignments)

• Lesson 1	Organophosphates	two weeks	<i>Two credits</i>
• Lesson 2	Paraquat	one week	<i>One credit</i>
• Lesson 3	Methamoglobinaemia	one week	<i>One credit</i>
• Lesson 4	Other Insecticides and Herbicides	one week	<i>One credit</i>
• <u>Mid Module Assignment</u>	Assignment	one week	<i>One credit</i>
• Lesson 5	Hydrocarbons	two weeks	<i>Two credits</i>
• Lesson 6	Toxic Alcohols	two weeks	<i>Two credits</i>
• Lesson 7	Corrosive Poisoning	one week	<i>One credit</i>
• Lesson 8	Hydrofluoric Acid	one week	<i>One credit</i>
• Lesson 9	Lead	one week	<i>One credit</i>
• Lesson 10	Arsenic	one week	<i>One credit</i>
• Lesson 11	Thallium	two weeks	<i>Two credits</i>
• Lesson 12	Mercury	one week	<i>One credit</i>
• Lesson 13	Other Heavy Metals	one week	<i>One credit</i>
• Lesson 14	Cyanide	one week	<i>One credit</i>
• Lesson 15	Carbon Monoxide	two weeks	<i>Two credits</i>
• <u>End of Module Assignment</u>	Assignment	two weeks	<i>Two credits</i>

Total Number of Credits = 23

3. Plants and Animals (Contain two sections with altogether 14 lessons and 2 assignments)

- Section 1 – **Plants** – 8 Lessons and 1 Assignment

▪ Lesson 1	Plants that contain Cardiac Glycosides	two weeks	<i>Two credits</i>
▪ Lesson 2	Colchicine containing Plants	one week	<i>One credit</i>
▪ Lesson 3	Hallucinogenic Plants	one week	<i>One credit</i>
▪ Lesson 4	Poisoning with Plants that can induce muscle spasm	one week	<i>One credit</i>
▪ Lesson 5	Proconvulsant Plants	one week	<i>One credit</i>
▪ Lesson 6	Miscellaneous Plant Poisoning	one week	<i>One credit</i>
▪ Lesson 7	Herbals	one week	<i>One credit</i>
▪ Lesson 8	Mushrooms	one week	<i>One credit</i>
▪ <u>Mid Module Assignment</u>	Assignment	one week	<i>One credit</i>

Total number of credits = 10

- Section 2 – **Toxinology/Animal poisoning** – 6 Lessons and 1 Assignment

▪ Lesson 1	Epidemiology of Snake bites and Taxonomy of Snakes	one week	<i>One credit</i>
▪ Lesson 2	Venom Chemistry and Diagnosis of Envenoming	one week	<i>One credit</i>
▪ Lesson 3	Management of Snake Envenoming and Anti venom	one week	<i>One credit</i>
▪ Lesson 4	Management of complications and Supportive care	one week	<i>One credit</i>
▪ Lesson 5	Education of Public	one week	<i>One credit</i>
▪ Lesson 6	Management of Insect Stings	one week	<i>One credit</i>
▪ <u>End of Module Assignment</u>	Assignment	two weeks	<i>Two credits</i>

Total Number of credits = 8

4. Pharmaceutical Poisoning (Contain 14 lessons and 2 assignments)

• Lesson 1	Beta Blockers and Calcium Channel Blockers	two weeks	<i>Two credits</i>
• Lesson 2	Xanthines	one week	<i>One credit</i>
• Lesson 3	Sedating Antihistamines	one week	<i>One credit</i>
• Lesson 4	Vasodilators	one week	<i>One credit</i>
• Lesson 5	Antiarrhythmics	one week	<i>One credit</i>
• <u>Mid Module Assignment</u>	Assignment	one week	<i>One credit</i>
• Lesson 6	Cardiac Glycosides	one week	<i>One credit</i>
• Lesson 7	Anticoagulant Poisoning	one week	<i>One credit</i>
• Lesson 8	Biguanides, Sulphonylureas and Insulin	one week	<i>One credit</i>
• Lesson 9	Analgesics and Anti-Inflammatory NSAID Poisoning	one week	<i>One credit</i>
• Lesson 10	Opioids	one week	<i>One credit</i>
• Lesson 11	Methotrexate and Colchicine	one week	<i>One credit</i>
• Lesson 12	Valproate, Phenytoin and Carbamazepine	two weeks	<i>Two credits</i>
• Lesson 13	Quinine and the Anti malarial Agents	one week	<i>One credit</i>
• Lesson 14	Clonidine and Ergots	one week	<i>One credit</i>
• <u>End of Module Assignment</u>	Assignment	two weeks	<i>Two credits</i>

Total Number of credits = 19

Elective Course Units

1. Chemical Disaster (Contain 10 lessons)

• Lesson 1	Toxicology of some Major industrial Chemicals	one week	<i>One credit</i>
• Lesson 2	Combustion Toxicology	one week	<i>One credit</i>
• Lesson 3	Major Chemical Incidents	one week	<i>One credit</i>
• Lesson 4	Management of Hazmat incidents Roles of Different Agencies	one week	<i>One credit</i>
• Lesson 5	Public health response to Chemical emergencies	two weeks	<i>Two credits</i>
• Lesson 6	UN GHS system classification and labeling of Chemicals	one week	<i>One credit</i>
• Lesson 7	Safety Data Sheets (SDS)	one week	<i>One credit</i>
• Lesson 8	Chemical Principles – Fire and Explosions	one week	<i>One credit</i>
• Lesson 9	<i>Legislation pertaining to Chemical Control</i>	one week	<i>One credit</i>
• Lesson 10	ALPHA	two weeks	<i>Two credits</i>

Total Number of credits = 10

2. Community Health and Environmental Toxicology (Contain two sections with 5 lessons)

- Section 1 – Community Health – 4 lessons

▪ Lesson 1	Basic Concepts of Epidemiology, Measures in Epidemiology and Epidemiological Study designs.	two weeks	<i>Two credits</i>
▪ Lesson 2	Global Epidemiology of Poisoning	one week	<i>One credit</i>
▪ Lesson 3	Epidemiology of Poisoning in Developing Countries and Sri Lanka	one week	<i>One credit</i>
▪ Lesson 4	Prevention of Poisoning	two weeks	<i>Two credits</i>

- Section 2 – Environmental Toxicology – 1 lesson

• Lesson 1	Environmental Toxicology	three weeks	Three credits
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Total Number of credits = 10

3. Addiction (Contain 4 lessons)

• Lesson 1	Toxicological aspects of Ethanol	two weeks	Two credits
• Lesson 2	Toxicological aspects of Methanol	one week	One credit
• Lesson 3	Toxicological aspects of Smoking Tobacco	one week	One credit
• Lesson 4	Toxicology of Drugs of Abuse	four weeks	Four credits

Total Number of credits = 10

4. Regulatory Sciences (Contain 6 lessons)

• Lesson 1	Epidemiology of Poisoning and Principles of Forensic Toxicology	one week	One credit
• Lesson 2	Principles of Occupational Toxicology and Classification of Chemicals	one week	One credit
• Lesson 3	Mode of Entry of Chemicals and Hazards, Risks and Risk Management	two weeks	Two credits
• Lesson 4	Exposure Limits, Regulatory Frame work and Poisoning Prevention	two weeks	Two credits
• Lesson 5	Issues Related to Control of Poisoning and Psychiatric and Social Determinants	two weeks	Two credits
• Lesson 6	Food Toxicology	two weeks	Two credits

Total Number of credits = 10

Annexure 2:

Portfolio marking scheme for MSc in Medical Toxicology

Student Index No.:

Batch No:

Date:

	Category	Marks				
		1	2	3	4	5
Structure & style:						
1	Maintaining confidentiality					
2	Organization of material					
3	Clarity of written expression (correct grammar etc)					
4	Use of appropriate language					
5	Style of referencing					
Content						
6	Accurate description of cases					
	Accurate interpretation of,					
7	Resuscitation					
8	Decontamination					
9	Antidote administration					
10	Investigations					
11	In ward care and monitoring					
12	Psychiatric assessment					

13	Follow-up after discharge					
14	Use of relevant references/ citations					
15	Integrating information					
Discussion:						
16	Critical evaluation of the management					
17	Citing evidence from literature					
18	Discussing the optimal management					
19	Challenges in achieving the optimal management					
20	Self reflection of the learning experiences					

Total marks

Final result

Approved by the Senate- 344th meeting on 30.03.2011-Minute No: 344.19.