POSTGRADUATE INSTITUTE OF SCIENCE
UNIVERSITY OF PERADENIYA

Master of Applied Epidemiology Degree Programme
(SLQF Level 9)

Master of Science (M.Sc.) in Applied Epidemiology Degree Programme
(SLQF Level 10)

1. INTRODUCTION

As the population exceeds 20 million people in a small country like Sri Lanka public health challenges could expand tremendously. The practice of global public health has expanded to include a network of practicing epidemiologists working together and with other public health practitioners to address commonly shared challenges and opportunities.

Epidemiology is the key scientific discipline underlying some of the most important areas of medicine including public health, clinical research, clinical trials and health services research. Epidemiological studies and research has become an important tool in the study of aetiology of diseases, natural history of infectious and non-infectious diseases and in assessing health effects in populations. Epidemiological information is used to plan and evaluate strategies to prevent illness, as a guide to the management of patients and in animals in whom the disease in question has already developed.

There are increasing concerns about the adequacy of current training in epidemiology for public health practice. In preparing epidemiologists for the expanded scope of problems relevant to public health intervention, the proposed M.Sc/ Postgraduate Diploma course in **Applied Epidemiology** is designed to provide excellence in teachings of epidemiological, bio statistical concepts and methods. The emphasis will be given to practical applications of epidemiological methods in clinical and in public health settings.

The Postgraduate Institute of Science (PGIS) is well organized and supported with a trained academic staff and has access to relevant institutions for practical training. In addition the PGIS has the opportunity of obtaining services from academic staff members with postgraduate qualifications from some of the best universities in the world. The members of the teaching panels are drawn from eight faculties of the University of Peradeniya, as well as from other universities and institutes. The excellent research facilities available at the Faculty of Science and other science-based Faculties of the University of Peradeniya and research institutions in the country are used to provide research training to students.

The teachers of the course will be those who have been teaching epidemiology and related subjects, both theory and practical in veterinary, medical and basic science fields. In addition, they are experts with field experience in applications of such epidemiological principles in combating outbreaks, disastrous conditions together with disease surveillance and monitoring. Teaching will be carried out through lectures, seminars and practical sessions. Seminar discussions will focus on current issues, applications and developments in epidemiology. The practical sessions will involve data collection,

data entry and processing, analysis, interpretation of results and discussions. Furthermore, small working groups will be formed among the participants to discuss variety of epidemiological studies with the use of computer facilities available at the PGIS. Extensive reading and critical analysis of published scientific literature of global and national importance will be stressed.

2. OBJECTIVES OF THE PROGRAMME

The programme will provide students with an understanding of epidemiological concepts with training in essential methodological skills required to conduct epidemiological studies in human and animal populations.

On completion of the programme, students will be able to:
- demonstrate an understanding of the key concepts in the discipline of epidemiology;
- apply epidemiological principles to surveillance and disease control within animal and human populations;
- communicate effectively with researchers from different disciplinary backgrounds;
- select an appropriate study design when confronted with an epidemiological investigation;
- question and develop a detailed study protocol capable of answering a given research question;
- analyse and interpret epidemiological data derived from cross-sectional, case-control and follow-up studies ;
- propose appropriate solutions and mitigatory measures to control epidemic conditions.

3. PROGRAMME ELIGIBILITY

Candidates having a bachelor's degree with 30 credits including relevant modules of epidemiology or equivalent accredited prior learning experience are eligible to follow the programme. Eligible applicants shall face a selection examination followed by an interview, conducted by the PGIS. Employed candidates eligible for admission should produce evidence of leave granted to follow the programme and a letter of release from the Head of the Department/Institution.

4. PROGRAMME FEE

Category	Programme Fee	
	Master of Applied Epidemiology degree programme	M.Sc. in Applied Epidemiology degree programme
Local candidates	Rs. 250,000.00	Rs. 350,000.00
Foreign candidates	Rs. 500,000.00	Rs. 700,000.00

Students registered for the Master of Applied Epidemiology degree programme shall pay the Programme fee in full or in two *or* in three installments. An additional payment of Rs. 100,000/- should be made at the end of the first year to continue for the M.Sc. in Applied Epidemiology degree programme. Other payments including registration fee, medical fee, library subscription, examination fee and deposits (science and library) should be paid according to the procedure stipulated by the PGIS. (N.B. The Programme fees given above may be revised as per recommendation of the Board of Management of the PGIS.)

5. THE PROGRAMME STRUCTURE AND DURATION

This programme consists of three options for completion.

5.1 Masters Degree by Course Work (SLQF Level 9)

The Master of Applied Epidemiology degree can be obtained by completing course work only (without conducting any research project).

Course work, comprising of theory courses, and laboratory and/or fieldwork, shall be conducted over a period of two semesters of 15 weeks each. The total duration of the degree, including examinations, shall be about 12 months. Satisfactory completion of a minimum of 30 credits of course work with a GPA of not less than 3.00 is required for the successful completion of the degree (Students who do not satisfy the above criteria but obtain a GPA in the range 2.75 to 2.99 for course work of 25 credits are eligible for the Postgraduate Diploma in Applied Epidemiology, and those who obtain a GPA in the range 2.75 to 2.99 for course work of 20 credits are eligible for Postgraduate Certificate).

5.2 Masters Degree (SLQF Level 10)

In addition to Masters Degree with course work (5.1), the Masters Degree (Research) requires a research project. The duration of the entire programme shall be 24 months inclusive of 5.1. Completion of all the requirements of 5.1 with a GPA of not less than 3.00 is a prerequisite for the Masters Degree (Research). The research project for this degree should be conducted on full-time basis, and completed during the second year. The research component is allocated 30 credits, totalling 60 credits for the entire programme. After successful completion of the research project, the student shall be eligible for the award of the M.Sc. in Applied Epidemiology degree - SLQF Level 10 (Students who do not complete the research project within the stipulated time period shall be awarded the Master of Applied Epidemiology degree - SLQF Level 9).

5.3 Extension of the programme for M.Phil. or Ph.D.

After conducting research for a period of six months in the M.Sc. degree (research) programme, students who have demonstrated exceptional progress may apply for upgrading the degree status to M.Phil. The student should continue the research project and any additional research work/assignments recommended by the PGIS for a total of two years (60 credits of research) to qualify for the award of the M.Phil. degree.

During the second year of research, students who have demonstrated exceptional and continuous progress may apply for upgrading the degree status from M.Phil. to Ph.D. The student should continue the research project and any additional research work/assignments recommended by the PGIS for another year on full-time basis (additional 30 credits) to qualify for the award of the Ph.D. degree.

Master of Applied Epidemiology Degree Programme (SLQF Level 9)
Master of Science (M.Sc.) in Applied Epidemiology Degree Programme (SLQF Level 10)

Programme Summary

Course Code	Course	Lecture hrs	Practical hrs	No. of Credits
ZLE 501	Introduction to Epidemiology	15	-	1
ZLE 502	Methods in Epidemiology I	20	20	2
ZLE 503	Methods in Epidemiology II*(pre requisite – ZLE 502)	20	20	2
ZLE 504	Environmental Epidemiology	20	20	2
ZLE 505	Overview of Public Health	20	20	2
ZLE 506	Zoonoses and Public Health	30	30	3
ZLE 507	Public Health Policy and Law	15		1
ZLE 508	Infectious Disease Surveillance and Outbreak Investigation	20	20	2
ZLE 509	Bioinvasions, Bioterrorism, Biosecurity and Public Health	30	30	3
ZLE 510	Biostatistics and Statistical Applications in Health Sector	20	20	2
ZLE 511	Health Care Systems: Management & Evaluation Techniques*	20	20	2
ZLE 512	Sociology of Health, Illness & Health Promotion*	15		1
ZLE 513	Research Methodology, Scientific writing, and Seminar	20	20	2
ZLE 599	Independent Study	500 notional hrs.		5
ZLE 699	Research Project**	3000 notional hrs. (one year duration)		30

NC – No change
*** Compulsory for M.Sc. in Applied Epidemiology (SLQF Level 10).*
**Optional courses. Students are required to obtain four credits from optional courses.*

6. PROGRAMME CONTENTS

Course Code: ZLE 501

Course Title: Introduction to Epidemiology (1 Credit)
Prerequisites: None

Course Objectives: At the completion of this course, the student will be able to:
- Assess major epidemiologic events and studies in the context of the historical evolution, landmark studies and applications of epidemiology;
- Assess disease concepts using basic epidemiologic concepts, including the natural history of disease, measurement of risk, models of disease transmission, levels of prevention, and causality, including environmental and genetic causes of disease;
- Assess current epidemiologic studies based on the strengths and weaknesses of the major study designs used in epidemiology; cross-sectional, case -control, cohort and clinical trials;
- Assess the effects of bias, confounding, power of studies, and attrition on validity, reliability and generalizability in epidemiologic studies, apply standard approaches for handling them through study design and analysis;
- Evaluate and synthesize scientific literature on an epidemiologic problem of the student's choice, using the concepts provided during this course, in a term paper and an oral presentation.

Course Content: The course introduces the basic principles and methods of epidemiology and demonstrates their applicability in the field of public health. Topics to be covered include the historical perspective of epidemiology, measures of disease occurrence and of association, clinical epidemiology, diagnostic tests, causal inference, and basic study design, trends in epidemiology.

Students Assessment:
The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.).
The weightage of marks given below can generally be used as a guideline in the computation of the final grade.
End of course examination - 50%
Other examination(s) (within course) - 30%
Assignments - 20%

Course Code: ZLE 502

Course Title: Methods in Epidemiology I (2 Credits)
Prerequisites: None

Course Objectives: At the completion of this course, the student will be able to:
- Analyze the scientific foundation for the establishment of causation;
- Analyze the strengths and weaknesses of the following study designs: case-control, cohort, randomized clinical trial, and community intervention trial;
- Evaluate the role of clinical epidemiology in community health; analyze the scientific foundations of disease surveillance and screening in public health;
- Identify the methods and strategies for conducting infectious disease epidemiology.

. **Course Content:** This course will introduce the student to the most common analytic methods in

epidemiology. Students will learn how to design epidemiologic studies, to choose appropriate research designs, and to utilize common statistical tests. Emphasis will be placed on case control studies, cohort studies, cross sectional studies, clinical epidemiology, community intervention trials, infectious disease epidemiology and errors in epidemiological survey.

Students Assessment:
The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.).
The weightage of marks given below can generally be used as a guideline in the computation of the final grade.
End of course examination - 50%
Other examination(s) (within course) - 30%
Assignments - 20%

Course Code: ZLE 503:
Course Title: Methods in Epidemiology II (2 Credits)

Prerequisites: Methods in Epidemiology I (2 Credits)

Course Objectives: At the completion of this course, the student will be able to:
- Understand the basic demography
- Measure the disease frequency
- Direct and in-direct standardization
- Criteria for causality
- Matched case control studies
- Clinical trial planning and interpretation
- Advanced design concepts of ecological, cross-sectional, case-control, and cohort studies

Course Content: This course will introduce the student to advance analytic methods in epidemiology. Students will be able to design techniques that will help to choose appropriate research designs in the field of epidemiology, and to utilize advance statistical methods. Emphasis will be placed on identifying the diseases with unknown etiology, clinical epidemiology.

Students Assessment:
The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.).
The weightage of marks given below can generally be used as a guideline in the computation of the final grade.
End of course examination - 50%
Other examination(s) (within course) - 30%
Assignments - 20%

Course Code: ZLE 504

Course Title: Environmental Epidemiology (2 Credits)
Prerequisites: None

Course Objectives: At the completion of this course, the student will be able to:

- Identify some of the major chemical, physical, and biological agents as risk factors for environmentally-related diseases.
- Describe hazardous effects of some major environmental exposures on human physical health, including disease induction, physiological impairment, and genetic susceptibility to risk.
- Describe pathways of exposure to hazardous agents in the workplace and general environment.
- Describe methods for assessing human exposures to hazardous agents for epidemiological research purposes.
- Describe the influences of genetic susceptibility on risks related to environmental agents.

Course Content: This course focuses on methods to study relations between exposure to environmental agents (for example air pollutants and metals) or conditions (heat waves) and effect markers, symptoms, morbidity and mortality in population and subgroups. It also describes how to use the information from epidemiological and toxicological studies in risk assessment and environmental health impact assessment.

Students Assessment:
The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.).
The weightage of marks given below can generally be used as a guideline in the computation of the final grade.
End of course examination - 50%
Other examination(s) (within course) - 30%
Assignments - 20%

Course Code: ZLE 505

Course Title: Overview of Public Health (2 Credits)
Prerequisites: None

Course Objectives: At the completion of this course, the student will be able to:
- Achieve familiarity with various components of the public health policy implementation;
- Understand interrelationships among different components in public health systems;
- Acquire the ability to apply knowledge and understanding to solve important health issues and problems;
- Acquire awareness on the importance of independent reading and independent study;
- Develop basic computer skills for accessing information and communicating with peers;
- Appreciate the unique characteristics of public health practices as a social enterprise;
- Appreciate the importance of disease prevention and health promotion in our community.

Course Content: This course provides an introduction to public health concepts and practice by examining the philosophy, purpose, history, organization, functions, tools, activities and results of public health practice in community. The course also addresses important health issues and problems faced by public health systems. Case studies and a variety intended practice-related exercises serve as a basis for learner participation in real world public health problem-solving simulations.

Students Assessment:
The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.).
The weightage of marks given below can generally be used as a guideline in the computation of the final grade.

End of course examination - 50%
Other examination(s) (within course) - 30%
Assignments - 20%

Course Code: ZLE 506

Course Title: Zoonoses and public health (3 Credits)
Prerequisites: None

Course Objectives: At the completion of this course, the student will be able to:
- Define zoonotic disease and become familiar with the most common routes of transmission from animals to humans.
- Understand that zoonotic diseases account for five of the six bioterrorism Category A agents and become familiar with these agents.
- Understand what outbreaks are commonly caused by zoonotic agents.
- Explain the difference between bioterrorism and agroterrorism, realizing that animal populations as well as human populations may be targets for terrorism.
- Compare animal disease surveillance systems to human disease surveillance systems.
- Demonstrate the use of fundamentals of zoonotic diseases and outbreak investigation by working through examples of case studies and previous outbreaks
- Describe the required public health competencies for environmental health staff.

Course Content: This course will introduce zoonotic disease basics, and explore zoonotic diseases as potential bioterrorism agents with emphasis on the Category A zoonotic agents. The topics of food security and agroterrorism, framework for disease surveillance. A brief case study will be conducted by participants on a zoonotic disease investigation in Sri Lanka and the role of environmental health professionals in such activities.

Students Assessment:
The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.).
The weightage of marks given below can generally be used as a guideline in the computation of the final grade.
End of course examination - 50%
Other examination(s) (within course) - 30%
Assignments - 20%

Course Code: ZLE 507

Course Title: Public Health Policy and Law (1 Credit)
Prerequisites: None

Course Objectives: At the completion of this course, the student will be able to:
- Identify the basic characteristics of public health policy, the steps involved in policy making, and the nature and role of politics in policy making and implementation;
- Understand different roles of various governmental organizations, media, court of law and

other groups with interest in formulating and implementing public health policies;
- Describe basic legal framework which underlies public health practices;
- Interpret the development and evolution of major public health policy in the context of the forces that determine policy making;
- Apply these models and knowledge to propose new policies that address significant health concerns.

Course Content: This course is designed to explore the major governmental and legal forces that are involved in public health policy in Sri Lanka. In addition, knowledge on the roles of media, public and court of law in developing new policy and implementation will be imparted.

Students Assessment:
The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.).
The weightage of marks given below can generally be used as a guideline in the computation of the final grade.
End of course examination - 50%
Other examination(s) (within course) - 30%
Assignments - 20%

Course Code: ZLE 508

Course Title: Infectious Disease Surveillance and Outbreak Investigation (2Credits)
Prerequisites: None

Course Objectives: At the completion of this course, the student will be able to:
- Develop skills related to the investigation of communicable disease outbreak affecting their country.
- Plan and conduct a descriptive analysis of an outbreak: create epidemic curves, line-listing and summary tables of characteristics and maps with distribution of cases (spot maps or incidence maps)
- Choose between different designs to conduct an analytical epidemiological investigation of an outbreak
- Communicate the results of an outbreak investigation

Course Content: This course is designed to impart knowledge on introduction to outbreak investigation, disease surveillance, cohort and case-control studies, developing questionnaires, data entry and validation, processing, descriptive epidemiology, analysis of time characteristics (epidemic curve), analysis of place characteristics (mapping of cases using GIS), analytical epidemiology, bivariate analysis, analytical epidemiology, stratified analysis, analytical epidemiology and to introduce the participant to multivariate analysis.

Students Assessment:
The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.).
The weightage of marks given below can generally be used as a guideline in the computation of the final grade.
End of course examination - 50%
Other examination(s) (within course) - 30%
Assignments - 20%

Course Code: ZLE 509

Course Title: Bioinvasions, Bioterrorism Biosecurity, and Public Health (3 Credits)
Prerequisites: None

Course Objectives: At the completion of this course, the student will be able to • Understand emerging public health and safety issues • analysis, evaluation, and solutions for homeland security health threats that imperil our citizens and those who must respond to preserve their health • translate new ideas into effective solutions that address country-based health security needs plan, train and serve in executive leadership, public health, hospital and emergency preparedness in local and international settings.
Course Content: This course is designed to study the significance of biological invasions: high profile and potentially devastating consequences. Impacts of bioinvasions on human health, agriculture, infrastructure and the environment will be discussed. A comprehensive approach to biosecurity, bioterrorism, and invasive alien species of plants will be emphasized. Prevention, early detection and methods of rapid response to situations will be discussed. The role of scientific community, industry and the public in ensuring environmental and community safety will also be discussed.
Students Assessment: The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.). The weightage of marks given below can generally be used as a guideline in the computation of the final grade. End of course examination - 50% Other examination(s) (within course) - 30% Assignments - 20%

Course Code: ZLE 510

Course Title: Biostatistics and Statistical Applications in Health Sector (2 Credits)
Prerequisites: None

Course Objectives: At the completion of this course, the student will be able to: • Recognize research questions which are appropriate for statistical analysis; • Define research questions with the statement of the null and research hypotheses; • Distinguish between parametric and non-parametric data; • Determine which statistical procedure is appropriate for a specific research question; • Apply the selected statistical procedure to the data available; • Analyze the statistical results; • Determine if the results are statistically significant in order to accept or reject the research hypothesis
Course Content: This is an elementary course in statistical methods applied to health-related problems. The statistical issues encountered by public health professionals will generally be health-

related. For public health professionals, knowledge of statistical procedures and terminology is essential for understanding research articles that present new information in areas of expertise and for conducting research studies. Those details will be taught, discussed and exercised.

Students Assessment:
The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.).
The weightage of marks given below can generally be used as a guideline in the computation of the final grade.
End of course examination - 50%
Other examination(s) (within course) - 30%
Assignments - 20%

Course Code: ZLE 511
Course Title: Health Care Systems: Management & Evaluation Techniques (2 credits)
Prerequisites: None

Course objectives: At the completion of the course, the student will be able to identify strengths and weaknesses of health monitoring and evaluation systems and make positive constructive remarks for potential upgrading of such systems.

Course Content: Performance monitoring and management of health care systems, effectiveness evaluation of health management systems to improve its efficiency while enhancing staff satisfaction. The content of the course includes motivation, knowledge management, managing diversity, leadership, recruitment and organizational
culture, the design of evaluations, information on the theoretical underpinnings of evaluation strategies and examples from practice.

Students Assessment:
The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.).
The weightage of marks given below can generally be used as a guideline in the computation of the final grade.
End of course examination - 50%
Other examination(s) (within course) - 30%
Assignments - 20%

Course Code: ZLE 512
Course Title: Sociology of Health and Illness & Health Promotion (1 Credit)
 Prerequisites: None

Course objectives: At the end of the course, the student will be able to identify sociological aspects of current health monitoring systems so that they could possibly be improved for the best ability of the staff and the patient/client.

Course Content:: An introduction to sociological perspectives on health and illness, social patterns of health and illness and possible explanations; responses to health and illness by individuals, families, lay contacts and professionals; and the social processes by which some experience come to

be defined and treated as illness while others do not; an approach to health promotion encompassing social and political action to address inequalities in health as well as health education, major issues in health promotion planning, implementation and evaluation from a number of perspectives including psychology, education, epidemiology and sociology

Students Assessment: The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.). The weightage of marks given below can generally be used as a guideline in the computation of the final grade. End of course examination - 50% Other examination(s) (within course) - 30% Assignments - 20%

Course Code: ZLE 513
Course Title: Research Methodology, Scientific Writing, and Seminar (2 credits)
Prerequisites: None

Course objectives: At the end of the course, the student will be able to apply appropriate data collection and analytical methods in epidemiological and public health related research. In addition, they should also be able to present the problem to a statistician, if and when required. Furthermore, they will also acquire the ability to properly document the findings and also the present it both in writing and verbally.
Course Content: In this course, the nature and concepts of research, types of research and tools of research, research design and conceptualization, causality, survey research and data collection techniques, strategies for data analysis and their applications, scientific writing and writing research reports, scientific papers and dissertations, preparing presentations, preparation of bibliography; information gathering through internet and use of electronic resources will be highlighted. Each student is required to present a seminar based on review of literature on a current development in the area of epidemiology.
Students Assessment: The evaluation of the course shall be based on three components: within course and end of course examinations and assignments (quizzes, tutorials etc.). The weightage of marks given below can generally be used as a guideline in the computation of the final grade. End of course examination - 50% Other examination(s) (within course) - 30% Assignments - 20%

Course code	599
Course title	Independent Study
Credits	05
Compulsory/optional	Compulsory
Prerequisites	None
Time allocation	500 notional hrs.
Aims	Aims: The overall aim is to familiarize the student with concepts and methods involved in scientific research

	Specific aims:
	1. To understand the scientific process in the conduct of research. 2. To develop skills to write a review paper and a scientific research proposal. 3. To develop skills to make a presentation. 4. To master the application of statistical methods on quantitative scientific data.
Intended learning outcomes	At the end of the successful completion of the course, students will be able to, 1. Conduct an independent review of literature on a selected topic in the area of Analytical Chemistry. 2. Write a formal scientific report conforming to the guidelines provided. 3. Transfer the knowledge gained through (2) and (3) above in the form of a presentation. 4. Complete a research proposal conforming to the guidelines provided. 5. Perform statistical analysis of quantitative data.
Time allocation	500 h
Content	*Review paper*: Review of literature; Development of the review paper in concise and professional manner and logical presentation of results that have been reported, writing the abstract, compilation of the list of references. *Proposal writing*: Interpretation and critical evaluation of results of published research; Formulation of a research problem: Concise literature review, justification, time frame, identification of resources, budgeting, etc. *Project*: Collection and statistical analysis of data on a topic associated with the review paper. *Seminar*: Presentation of literature and data collected on a given topic; Preparation of an abstract, preparation of slides.

Assessment criteria: Continuous Assessment

Component	% marks
Review paper	20
Proposal writing	10
Project	40
Seminar	30

Recommended Texts:
1. Backwell, J., Martin, J. (2011) A Scientific Approach to Scientific Writing, Springer.
2. Postgraduate Institute of Science (2016) Guidelines for Writing M.Sc. Project Report/M.Phil. Thesis/Ph.D. Thesis
3. Priyantha, N. (2015) Measurements and Errors in Chemical Analysis, Science Education Unit, University of Peradeniya.

Course code	699
Course title	Research Project
Credits	30
Compulsory/optional	Compulsory
Prerequisites	GPA of 3.00 at M.Sc. (Course work)
Time allocation	3000 notional hrs. (one year duration)
Aims	Aims: The overall aim is to prepare the student to conduct a research independently. **Specific aims:** 1. To train students to apply scientific method in scientific research. 2. To train students to generate researchable hypotheses. 3. To train students to plan, design and conduct scientific research. 4. To gather reliable scientific data, analyse, and interpret. 5. To develop skills in scientific writing.
Intended learning outcomes	At the end of the successful completion of the course, students will be able to, 1. Apply the scientific method. 2. Design a research project. 3. Complete a research project. 4. Describe ethical issues in scientific research. 5. Explain the patenting process in research. 6. Make presentations at national/international conferences. 7. Produce a thesis conforming to the requirements of the PGIS. 8. Write manuscripts for publication in refereed journals.
Content	The students will conduct sufficient amount of laboratory/field work on a chosen research topic under the guidance provided by an assigned supervisor/s, make a presentation of research findings at a national/international conference, and produce a thesis.

Assessment criteria

Continuous assessment	End-semester examination
30%	Oral examination (20%) Thesis (40%) Conference presentation (10%)

Recommended Texts:
1. Backwell, J., Martin, J. (2011) A Scientific Approach to Scientific Writing, Springer.
2. Postgraduate Institute of Science (2016) Guidelines for Writing M.Sc. Project Report/M.Phil. Thesis/Ph.D. Thesis
3. Priyantha, N. (2015) Measurements and Errors in Chemical Analysis, Science Education Unit, University of Peradeniya.

7. PROGRAMME EVALUATION

Evaluation of Course work

Based on the scheme given below, the overall performance of a student in a given course shall be evaluated by the respective instructor(s) and a grade shall be assigned.

Evaluation Scheme
- For all courses a minimum of 80% attendance is expected.
- The evaluation of each course (except independent study and research project) shall be based on within course and end of course examinations, and assignments. The weightage of marks given below can generally be used as a guideline in the computation of the final grade, except for Independent Study and Research Project.

End of course examination	50 - 60%
Continuous assessments (mid-semester examination, assignments, etc.)	40 - 50%

- Courses with laboratory and/or fieldwork shall be evaluated, where applicable, on a continuous assessment basis.
- The minimum grade a student should achieve to pass a course is C.
- Students will be informed of the evaluation scheme by the instructor at the beginning of a given course.

Grade Points and Grade Point Average (GPA)

The Grade Point Average (GPA) will be computed using the grades earned for core courses and optional courses, taken for credit.

On completion of the end of course examination, the instructor(s) is/are required to hand over the grades of a given course to the programme coordinator who will assign the Grade Points using the following table:

Grade	Grade Point
A+	4.0
A	4.0
A⁻	3.7
B⁺	3.3
B	3.0
B⁻	2.7
C⁺	2.3
C	2.0
D	1.0
E	0.0

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

$$GPA = \frac{\Sigma\, c_i g_i}{\Sigma\, c_i},$$

where c_i = number of credit units for the ith course, and
g_i = grade point for the ith course

Make-up Examinations

'Make-up' examinations may be given only to students who fail to sit a particular examination due to medical or other valid reasons acceptable to the PGIS.

Repeat Courses

If a student fails a course or wishes to improve his/her previous grade in a course, he/she shall repeat the course and course examinations at the next available opportunity. However, he/she may be exempted from repeating the course, and repeat only the course examinations if recommended by the teacher-in-charge or M.Sc. Programme Coordinator. The student may repeat the same course or a

substituted (new) optional course in place of the original course. A student is allowed to repeat five credits of coursework free-of-charge. The maximum number of credits a candidate is allowed to repeat is fifteen. The maximum grade, a candidate could obtain at a repeat attempt is a B and he/she is allowed to repeat a given course only on two subsequent occasions.

Evaluation of Research Project

Research project will be evaluated on the basis of a written report (M.Sc. project report) and oral presentation (see Section 6.0 of the PGIS Handbook for the format of the project report).

8. PANEL OF TEACHERS

	Name, qualifications and affiliation	Area of Specialization
1.	Prof. S. Dharmaratne, Department of Community Medicine, Faculty of Medicine, University of Peradeniya. *MBBS (Sri Lanka), M.Sc. (Sri Lanka), MD (Sri Lanka)*	Community Medicine
2.	Prof. O.A. Ileperuma, Department of Chemistry, Faculty of Science, University of Peradeniya *B.Sc. (Cey.), Ph.D. (Arizona USA)*	Inorganic Chemistry and Environmental Chemistry
3.	Prof. H.M.D.N. Priyantha, Department of Chemistry, Univ. of Peradeniya. *B.Sc. (Perad.), Ph.D. (Hawaii USA)*	Physical/Analytical Chemistry and Environmental Chemistry
4.	Prof. A. Jayasinghe, Department of Community Med., Faculty of Medicine, University of Peradeniya *MBBS (Sri Lanka), M.Sc. (London), DCH (London), FRCPH (UK), FRCP (London UK)*	Community Medicine
5.	Prof. S.H.P.P. Karunaratne, Department of Zoology, University of Peradeniya. *B.Sc. (Perad.), Ph.D. (London UK)*	Medical entomology; Zoology
6.	Prof. J. G. S. Ranasinghe, Department of Biochemistry, Faculty of Medicine, University of Peradeniya *BVSc (Perad.), MPhil (Japan), Ph.D. (Japan)*	Biochemistry
7.	Dr. A. Dangolla, Department of Veterinary Clinical Studies, Faculty of Veterinary Medicine & Animal Sciences, University of Peradeniya *BVSc (Perad.), Dip Vet Epid (Helsinki), PhD (KVL, Denmark)*	Epidemiology, Clinical Medicine and Surgery, Wildlife Medicine
8.	Dr. R. Kalupahana, Department of Veterinary Public Health and Pharmacology, Faculty of Veterinary Med. & Animal Sciences, University of Peradeniya *BVSc (Sri Lanka), Ph.D. (Canada)*	Veterinary Microbiology
9.	Dr. S. Tennakoon, Department of Community Medicine, Faculty of Medicine, University of Peradeniya. *MBBS (Sri Lanka), M.Phil, Ph.D (Oslo, Netherlands)*	Community Medicine

10.	Dr. K. Pethiyagoda, Department of Community Medicine, Faculty of Medicine, University of Peradeniy. *MBBS (Perad.), M.Sc. (Colombo), Ph.D (Birmingham UK)*	Community Medicine Occupational Health
11	Dr. S.K. Yatigammana, Department of Zoology, Faculty of Science, University of Peradeniya *B.Sc. (Perad.), M.Sc. (Perad.), Ph.D. (Canada)*	Limnology and Environmental Science
12	Dr. S. Ginige, Consultant in Community Medicine, Epidemiology Unit, Ministry of Healthcare and Nutrition, Colombo *MBBS, M Sc, MD*	Community Medicine (Outside Expert)
13	Dr. S. Samarage, Former Deputy Director-General (Planning), Ministry of Healthcare & Nutrition, Colombo *MBBS, MPH, MD*	Consultant Community Physician (Outside Expert)
14	Dr Jagath Amarasekara, Consultant Epidemiologist Epidemiology Unit, Ministry of Healthcare and Nutrition, Colombo *MBBS, M Sc, MD*	Epidemiology (Outside Expert)
15	Dr. Kumudu Bandara, Consultant Community Physician, Ministry of Health. *MBBS, M Sc, MD*	Community Medicine (Outside Expert)

9. PROGRAMME COORDINATORS

Dr. N. P. S. Kumburegama
Department of Zoology
Faculty of Science
University of Peradeniya
Tel.: 081 2394482
Email:skumburegama@yahoo.com