Master of Health Economics (MHlthEc)

1. Description

This course, offered by the Faculty of Graduate Studies, is designed for health professionals currently in or seeking to be in health care institution positions.

In all countries of the world, increasing pressures on scarce resources have meant that all investments, inside and outside the health sector, have come under closer scrutiny. This is especially true for the healthcare sector and in turn, has led to an increased interest in the economic evaluation of alternative strategies based on an economic perspective. Economic Evaluation consideration is about choosing between alternative uses of recourses. In doing so, both of the costs and the outcomes of investments are considered. As the basic assumption of any analysis is that there are not, and never will be, enough recourses to satisfy all needs completely tradeoffs have to be made where to invest and where not to. Master of Health Economics trains the graduate to generate evidence on the best use of available resources.

The Master of Health Economics is ideal for professionals looking to progress their careers in health policy, planning and management. The skills a student gains from the degree will enable him/her to integrate health economics into every day of health planning, service reorientation and policy development and implementation. Graduates will have a high level of professional skills and knowledge across the fields of health economics and will be well prepared for rewarding careers in a range of sectors nationally and internationally.

Relevance of proposed degree program to society

Health economics can be used either prospectively alongside the programme or independently to examine the impact of health programmes and policies. Sri Lanka is a lower-middle-income country with scarce resources. Lack of financial resources magnifies the need for health care while shrinking the capacity to finance it. Hence health financing and decision-making must be evidenced-based to gain maximum output from minimal input. However currently in Sri Lanka, there is no Masters in Health Economics programme. The current program is designed to provide specialization in the related fields of health economics and health care management with a

particular focus on Sri Lankan health systems. This training will build capacity to design health reform programs, perform economic evaluations of health care interventions, and be able to contribute to financing in public health activities. Participating in this course and gaining more in-depth knowledge in Health Economics and interaction with the faculty will facilitate to acquire experience in planning, analysis research and programme management especially related to Health Economics.

This programme enables you to develop specialized knowledge and advanced skills in areas that suit your interests, skills and career goals. The theoretical and practical skills you gain are consolidated through the completion of a case study, in which you focus on exploring in detail an economic problem within a health care setting or community.

2. Programme Outcomes

These course outcomes are aligned with the Sri Lanka Qualifications Framework level 9

Upon successful completion of this course, it is expected that students will be able to:

1. Develop an appreciation of economics, both as an intellectual discipline and as an important tool in analyzing health, health care and health policy
2. Prepare for a range of careers in health economics whether in industry, government or research
3. Progress either to further postgraduate research or to a career as a professional health economist after completing a Master's programme
4. An advanced understanding of the core principles in microeconomics, quantitative methods and econometrics
5. An understanding of the techniques which have been used in contemporary economic research
6. Select appropriately between alternative analytical techniques and research methodologies that can be used in health economics
7. Appreciation of how microeconomic analysis can help us to understand health, health care and health policy

8. Combine relevant theory and analytical techniques with insightful data analysis to produce convincing explanations of economic phenomena
9. Comprehend published economic research papers, and to integrate the implications of published research in their own studies
10. Select appropriate techniques to evaluate health interventions and/or policies
11. Formulate a plan for specific individual research that would further existing knowledge
12. Communicate the results of independent research.

3. Target Group

The program is designed for those who are already employed and interested in further studies in the multi-disciplinary studies related to health.

4. Entry Requirements

In order to be eligible for entry to the study programme leading to the Masters in Health Economics students must fulfil the following requirements:

(i) A medical or dental degree recognized with the Sri Lanka Medical Council.

OR

(ii) A Honours/Special degree in the field of Economics, Science or any other relevant discipline.

OR

(iii) Any other equivalent qualification accepted by the Senate.

5. Admission Process

- Selection test/ Interview

6. Program Duration and Credits

- Duration: **one year**
- Number of Credits: **30 Credits**

Alternative exit

Students may exit this course early and apply to graduate with the Postgraduate Diploma Health Economics after successful completion of minimum of 25 credits.

7. Medium of Instruction

- English

8. Course Structure

The master of health economics is offered for one year consists of two semesters with **15** compulsory course units.

1st Semester

Course code	Title of the course unit	Course Status	Credit Value
MHEC 51012	Basic Epidemiology	C	2
MHEC 51023	Basic Statistics	C	3
MHEC 51034	Microeconomics	C	4
MHEC 51041	Data Organization and Management	C	1
MHEC 51051	Non-Parametric Tests	C	1
MHEC 51062	Health Economics	C	2
MHEC 51072	Accounting and Finance	C	2
Total Credits-Semester-1			**15**

2nd Semester

Course code	Title of the course unit	Course Status	Credit Value
MHEC 52082	Health Policy	C	2
MHEC 52091	Reform and Development of Health Services	C	1
MHEC 52102	Econometrics	C	2
MHEC 52111	Forecasting	C	1
MHEC 52123	Economic Evaluation	C	3
MHEC 52131	Applied Econometrics	C	1

MHEC 52145	Independent project related to Health Economics	C	5
Total Credits-Semester-II			**15**

C - Core

9. Teaching Methods and Evaluation Criteria

9.1 Teaching Methods

Lectures/ Group discussions/ Role plays/ Workshops/Field visits

9.2 Evaluation Criteria

- **End Semester Assessment (ESA)**

The written examination will be conducted for each course unit at the end of the semester.

- **Continuous Assessment (CA)**

The evaluation criteria of each course unit will be announced by the relevant lecturer at the commencement of each course unit.

The percentage pass mark for CA and ESA is equivalent to the minimum marks assigned for Grade C. The proportion of marks allocated for CA will be up to 40% and the balance marks for the ESA for the calculation of the total marks for each module.

9.3 Grading System

The table below shows the twelve tier grading system recommended by University Grant Commission in Sri Lanka. “Grade” shall be awarded for a course unit by aggregating the marks obtained for CA and the ESA. Grade Point Average (GPA) of each student is calculated based on the Grade Point Value (GPA) assigned to each grade as indicated in the table below. GPA is calculated by considering all the course units attempted by a student in order to award the master degree.

Table 2: Twelve tier grading system

Range of marks	Grade	Grade Point Value
85-100	A+	4.00
70-84	A	4.00
65-69	A-	3.70
60-64	B	3.30
55-59	B	3.00
50-54	B-	2.70
45-49	C+	2.30
40-44	C	2.00
35—39	C-	1.70
30-34	D+	1.30
25-29	D	1.00
00-24	E	0.00

9.4 Grade Point average

Grade Point Average (GPA) is the credit–weighted arithmetic mean of the Grade point values. GPA is calculated by dividing the total credit–weighted 'Grade Point Value' by the total number of credits. GPA shall be computed to the second decimal place.

Example: A student who has completed **one-course unit** two credits, **three-course units** each of three credits and **two-course units** each of one credit with grades A,C,B,D,C+ and A+ respectively would have a GPA of 2.48 as calculated below.

$$\textbf{GPA} = \frac{(4.0 * 2 + 2.0 * 3 + 3.0 * 3 + 1.0 * 3 + 2.3 * 1 + 4.0 * 1)}{(2 + 3 + 3 + 3 + 1 + 1)}$$

GPA = 2.4846 = 2.48

Minimum eligibility criteria for the award of M HlthEc

(i) For the award of MHEC with coursework

(a) Accumulate grades of B- (B minus) or better in course units aggregating at least 30

credits.

(b) Obtain a GPA of 2.70 or greater, and

(c) Complete the relevant requirements within a period of three consecutive academic years'

(ii) For the award of a M HlthEc with course work with Merit a student must obtain

(a) Accumulate grades of B- (B minus) or better in course units aggregating at least 30 credits

(b) a GPA of 3.70or greater

(c) Obtain grades of A or better in course units aggregating to at least 50% of total credits for the course units considered

(d) Complete the relevant requirements within a period of one academic years

10. Course Detail

<table>
<tr><td>Semester 1</td><td colspan="3"></td></tr>
<tr><td>Course Code:</td><td colspan="3">MHEC 51012</td></tr>
<tr><td>Course Name:</td><td colspan="3">Basic Epidemiology</td></tr>
<tr><td>Credit Value:</td><td colspan="3">2</td></tr>
<tr><td>Core/Optional</td><td colspan="3">Core</td></tr>
<tr><td rowspan="2">Hourly Breakdown</td><td>Theory</td><td>Practical</td><td>Independent Learning</td></tr>
<tr><td>30</td><td></td><td>70</td></tr>
<tr><td colspan="4">Course Aim/Intended Learning Outcomes:
Upon successful completion of this unit, students should be able to:
➢ describe and be able to compute measures of disease frequency
➢ explain and contextualize the purposes of descriptive and analytical epidemiology;
➢ analyze the strengths and weaknesses of different epidemiological study designs;
➢ interpret and communicate the results of epidemiological studies</td></tr>
</table>

- solve complex problems relating to the use of epidemiological concepts and study designs.
- discuss probable sources of error and methods of minimizing errors in such data
- describe and calculate measures of risk of exposure
- critically analyze epidemiological papers from the medical research
- Argue for and against the different methods of data collection in survey research

Contrast the processes commonly used to collect data

Course Contents

Rates, Prevalence, Cumulative incidence, Incidence density, Proportionate Mortality & Proportionate Mortality Ratio, Survival rates: five year survival. Descriptive & analytical epidemiology, epidemiological study designs, Questionnaire design, sample and data collection methods, Odds Ratio, Relative Risk (RR), Attributable Risk (AR), Attributable Risk Percent, Random error, Systematic errors – Bias: Selection, Information & Confounding: Measures to overcome confounding, Matching, restriction & randomization, Stratified and multivariate analysis, interpretation of systematic reviews & meta-analysis.

Teaching /Learning Methods:

Lectures, interactive contacts, and discussions

Assessment Strategy:

CA (Case studies, assignments, reports, presentations, tests) and ESA.

Continuous Assessment	Final Assessment		
40%	60%		
Details: Quizzes- 20, mid-term - 20	Theory (%) 60%	Practical (%) NA	Other (%)(specify) NA

References/Reading Materials:

- Hennekens, C.H., Buring, J.E. (2006). Epidemiology In Medicine, Brown and Company, Boston.
- Rothman, K.J. Epidemiology-An introduction. Oxford University Press.

- Basic epidemiology, R Bonita, R Beagkehole, T Kjellstrom 2nd edition, 2006. World Health Organization.
- Beaglehole, D.R., Lasang, M.A., Gulliford , M.(Eds.). Oxford Text Book of Public Health. Volume 2.
- Grimes, D. A., Schulz, K.F. (2002). Epidemiology Series An overview of clinical research: the lay of the land. Lancet, 359, 57-61.
- Lucas, R. M., McMicheal, A. J. (2005 October). Association of causation: evaluating links between "environment and disease". Public Health Classics. Bulletin of the World Health Organization, 83(10), 792-795.
- Sackett, D. L. (1979). Bias in Analytical Research. J. Chron. Dis., 32, 51-63.

Semester 1			
Course Code:	**MHEC 51023**		
Course Name:	**Basic Statistics**		
Credit Value:	**3**		
Core/Optional	**Core**		
Hourly Breakdown	Theory	Practical	Independent Learning
	45		105

Course Aim/Intended Learning Outcomes:

Upon successful completion of this unit, students should be able to:

- Classify data into appropriate measurement types.
- Present data using relevant tables, graphical displays, and summary statistics, quantify uncertainty in study results.
- Formulate research hypotheses into a statistical context in public health studies.
- Estimate quantities of interest and evaluate hypothesis with appropriate statistical

methods.

- Accurately interpret statistical methods and results reported in health publications.
- Analyse data using a specific software package.

Course Contents

Introduction to Statistics, Classifying health data; summarizing data using simple statistical methods and graphical presentation; sampling distributions; probability and probability distributions, quantifying uncertainty in results from a sample; working with statistical distributions; comparing two or more groups/methods using confidence intervals and hypothesis tests (p - values); assessing the association between an outcome and several exposure variables. key concepts in sampling such as a sampling frame, non-response, and how to select samples using the main probability sampling methods (simple random sampling, systematic sampling, stratified sampling and cluster sampling).and non-probability sampling methods.

Classifying health data; summarizing data using simple statistical methods and graphical presentation; sampling distributions; quantifying uncertainty in results from a sample; working with statistical distributions; comparing two or more groups/methods using confidence intervals and hypothesis tests (p - values); assessing the association between an outcome and several exposure variables, interpretation of multiple regression.

Teaching /Learning Methods:

Lectures, interactive contacts, and discussions

Assessment Strategy:

CA (Case studies, assignments, reports, presentations, tests) and ESA.

Continuous Assessment	Final Assessment		
30%	70%		
Details: Quizzes- 15, mid-term -15	Theory (%) 70	Practical (%) NA	Other (%)(specify) NA

References/Reading Materials:

- Heiman, Gary W. Basic Statistics for the Behavioral Sciences. 4th ed. Boston, MA: Houghton Mifflin Company, July 2002. ISBN: 0618220178
- Robert W. Broyles. Fundamentals of Statistics in Health Administration Jones & Bartlett Learning, 2006 - Business & Economics - 374 pages
- Bernard Rosner, Fundamentals of Biostatistics, Cengage Learning, ISBN-13: 978-0538733496.
- Basic Statistical Analysis. Richard C. Sprinthall
- Medical Statistics. Betty R Kirkwood and Jonathan A. C. Sterne
- A Short Book of Medical Statistics. Sir Austin Bradford Hill
- Using and Understanding Medical Statistics. David E. Matthews and Vernon T. Farewell

Semester 1			
Course Code:	**MHEC 51031**		
Course Name:	**Data Organization and Management**		
Credit Value:	**1**		
Core/Optional	**Core**		
Hourly Breakdown	Theory	Practical	Independent Learning
		45	55

Course Aim/Intended Learning Outcomes:

On successful completion of this module, students will be able to:

- Explore a dataset in a number of ways
- Identify the data type for each variable in a dataset and create new variables with a specific data type
- Apply variable and value labels, check for implausible data values and duplicate

observations, ascertain missing data

- Reshape data between long and wide forms and merge relational datasets
- Sort observations and analyze data by different sub groups
- Use do files to keep track of the commands rerun analyses when required
- Use automated commands and create macros
- Use loops, nested loops and conditional execution within commands when required

Course Contents

- Data types, Storing and Importing Data, Convert between types and set the display formats for different variables, Changing the layout of a dataset and related functions, Reshape data between long and wide forms, Merging, Appending and Collapsing datasets, Stratification and perform operations separately for subgroups, Creating do files and inserting commands, Advanced Automation, Loops and conditional execution.

Teaching /Learning Methods:

Lectures, interactive contacts, Practical classes and discussions

Assessment Strategy:

CA (Case studies, assignments, reports, presentations, tests) and ESA.

Continuous Assessment 40%	Final Assessment 60%		
Details: Quizzes- 20, mid-term -20	Theory (%) N/A	Practical (%) 60	Other (%) N/A

References/Reading Materials:

- Armitage P, Berry G, Matthews JNS. Statistical Methods in Medical Research (4thedition). 2008; Wiley-Blackwell, London.

Semester 1	
Course Code:	**MHEC 51044**

<table>
<tr><td>Course Name:</td><td colspan="3">Microeconomics</td></tr>
<tr><td>Credit Value:</td><td colspan="3">4</td></tr>
<tr><td>Core/Optional</td><td colspan="3">Core</td></tr>
<tr><td rowspan="2">Hourly Breakdown</td><td>Theory</td><td>Practical</td><td>Independent Learning</td></tr>
<tr><td>15</td><td></td><td>160</td></tr>
<tr><td colspan="4">Course Aim/Intended Learning Outcomes:
Upon successful completion of this unit, students should be able to:
➢ Demonstrate knowledge and understanding of the principles of microeconomics applied to health and health care.
➢ Understand the four market models and how price and quantity are determined in each model.
➢ Understand pricing strategies in markets with competition.
➢ Analyze external costs and benefits that can occur in markets.
➢ understand role, limitations and usefulness of economic analysis and economics as a way of thinking, particularly when applied to the health care sector
➢ Analyze the impact of asymmetric information on market efficiency by explaining examples of adverse selection, moral hazard, and the principal-agent problem.
➢ Apply the model of behavior in risky circumstances by calculating expected utility, expected income, and certainty equivalents.
➢ Explain the role of game theory in economic models by representing various game-theoretic interactions.</td></tr>
<tr><td colspan="4">Course Contents
Introduction to Microeconomics, Microeconomic tools for health economics: Allocation of scarce resources. The concept of marginal analysis and rational decision making. Theory of consumer behavior, Theory of production and costs, Market structures: Definitions, characteristics and equilibrium of different market structures. Material on market</td></tr>
</table>

<table>
<tr><td colspan="4">imperfections/failures, Asymmetric information and risk, and role of the state in markets. Basic pricing strategies. Pricing strategies in markets with intense price competition, Market failures and the role of government in correcting market failures. Introduction to economic decision making. Conditions for a well-functioning market. Information economics; moral hazard and adverse selection. The Principal-Agent Problem. Risk and uncertainty. Insurance.</td></tr>
<tr><td colspan="4">Teaching /Learning Methods:
Lectures, interactive contacts and discussions</td></tr>
<tr><td colspan="4">Assessment Strategy:
CA (Case studies, assignments (written and practical), reports, presentations, tests) and ESA.</td></tr>
<tr><td>Continuous Assessment

40%</td><td colspan="3">Final Assessment

60%</td></tr>
<tr><td>Details:
Quizzes- 20, mid-term -20</td><td>Theory (%)

60</td><td>Practical (%)

NA</td><td>Other (%)(specify)

NA</td></tr>
<tr><td colspan="4">References/Reading Materials:
Christopher Snyder and Walter Nicholson, Microeconomic Theory: Basic Principles and Extensions, (11th edition, International Edition), South-Western College Publishing (2011).
Economics. Begg, David, Fischer, Stanley and Dornbusch, Rudiger, McGraw-Hill Publishers Inc. 2005.
Mankiw, N. Gregory. Principles of Microeconomics. 2nd ed. Ft. Worth: Harcourt College
Publishers, 2001.
Economics. Samuelson, Paul A and Nordhaus, William D, Irwin-McGraw-Hill 2009 - www.ips.lk/talkingeconomics/2011/04.
www.ips.lk/talkingeconomics/2013/04</td></tr>
</table>

- Christopher Snyder and Walter Nicholson, Microeconomic Theory: Basic Principles and Extensions, (11th edition, International Edition), South-Western College Publishing (2011).
- William F. Samuelson, Managerial Economics, Wiley, 8th Edition (2014).
- Hugh Gravelle & Ray Rees, Microeconomics, 3rd Ed. (2004).

Semester 1			
Course Code:	**MHEC 51051**		
Course Name:	**Non parametric Tests**		
Credit Value:	**1**		
Core/Optional	**Core**		
Hourly Breakdown	Theory	Practical	Independent Learning
	15		35

Course Aim/Intended Learning Outcomes:

On successful completion of this module, students will be able to:

- Identify appropriate non-parametric test for given real life problem, apply nonparametric tests, and interpret conclusions.
- Be able to develop and apply non-parametric methods of inference, with particular reference to problems of relevance in medical statistical contexts
- Be able to apply Bootstrap samples
- Be able to create empirical CDF and understand how to estimate the density.

Course Contents

Introduction to non parametric methods. Differences between parametric & non parametric tests, Calculation & Interpretation of one sample tests: Sign test, Wilcoxon signed rank test, Calculation & Interpretation of two sample tests: Mann-Whitney U test, paired Wilcoxon signed –rank test,

Analysis of Variance: Kruskal-Wallis H test, Friedman ANOVA, Spearman's rank

correlation, Robust Estimation, Jackknives and Bootstrap methods, Density Estimation			
Teaching /Learning Methods: **Lectures, interactive contacts, Practical classes and discussions**			
Assessment Strategy: CA (Case studies, assignments, reports, presentations, tests) and ESA.			
Continuous Assessment 40%	Final Assessment 60%		
Details: Quizzes- 20, mid-term -20	Theory (%) 60	Practical (%) N/A	Other (%) N/A
References/Reading Materials: ➢ Peter Sprent, Nigel C. Smeeton Applied Nonparametric Statistical Methods, Fourth Edition CRC Press ➢ Wayne W. Daniel , Applied Nonparametric Statistics 2nd Edition			

Semester 1			
Course Code:	**MHEC 51062**		
Course Name:	**Health Economics**		
Credit Value:	**2**		
Core/Optional	**Core**		
Hourly Breakdown	Theory	Practical	Independent Learning
	30		70

Course Aim/Intended Learning Outcomes:

On successful completion of this module, students will be able to:

- develop an understanding of the relevance of economic concepts to the health care sector.
- describe the system of health care financing and delivery arrangements in the health care sector
- Impart an understanding of the role of economic factors in the development of public policy concerning health and health care.

Course Contents

Introduction to Health Economics, An Overview of the Health Care Industry. Health, Measures of Health, Medical Care, and Medical Spending. Demand for Medical Services. Medical Care Production and Costs. Health Financing, The Demand for Medical Insurance. The Private Health Insurance Industry. Government Provision of Health Insurance. Nature of insurance contracts. The Physician Market. The Pharmaceutical Industry. Government Regulation and Intervention. Health and development.

Teaching /Learning Methods:

Lectures, interactive contacts, and discussions

Assessment Strategy:

CA (Case studies, assignments, reports, presentations, tests) and ESA.

Continuous Assessment	Final Assessment		
30%	70%		
Details: Quizzes- 15, mid-term -15	Theory (%) 70%	Practical (%) NA	Other (%)(specify) NA

References/Reading Materials:

- Culyer AJ, Newhouse JP. Handbook of health economics. 1st ed. Burlington: Elsevier Science; 2007.

- Culyer AJ. The dictionary of health economics. 2nd ed. Cheltenham, UK: Edward Elgar; 2010.
- Glied S, Smith P. The Oxford handbook of health economics. 1st ed. New York: Oxford University Press; 2011.
- Feldstein PJ. Health care economics. 7th ed. New York: Delmar Publishers; 2012.
- Jacobs P. The Economics of Health and Medical Care; Aspen Publishers, Inc. Gaithersburg, Maryland. 1991
- Mills A. and Gilson L. 1988, Health Economics for Developing Countries: A Survival Kit; EPC Publication no. 17, Health Policy Unit, LSHTM.
- Zschock D. K. Health Care Financing in Developing Countries, 1983
- Culyer A.J. and Newhouse J.P. 2000, North-Holland Handbook of Health Economics, Elsevier.
- Santerre R.E. and Neun S.P. Health Economics, Theories, Insights and Industry Studies, 5th Edition South-Western Cengage Learning, 2010

Semester 1			
Course Code:	**MHEC 51072**		
Course Name:	**Accounting and Finance**		
Credit Value:	**2**		
Core/Optional	**Core**		
Hourly Breakdown	Theory	Practical	Independent Learning
	45		105

Course Aim/Intended Learning Outcomes:

On successful completion of this module, students will be able to:

- Recognize key accounting terms and language.
- Illustrate how transactions that affect the financial position of a health care organization are recorded.

- Explain the construction of basic financial statements including balance sheets, income statements, and statements of cash flows.
- Analyze and interpret the information contained in basic financial statements.
- Demonstrate an understanding of different models for financing health services and the cost containment incentives and disincentives associated with each type of payment method.
- Relate the principles of management control systems to financial issues in health care.
- Demonstrate skills in building, analyzing and using a budget.
- Explain how to best optimize resource use, and appreciate the role of cost containment strategies

Course Contents

An introduction to basic accounting principles for non-accountants. Fundamentals of finance financial planning controlling and decision-making issues, financial statement analysis, budgeting, Cash flows analysis. Working capital management. User fees; outsourcing; social insurance; purchaser-provider splits and provider payment mechanisms; community financing. Advanced methods of cost of health care services: Activity-based costing; using cost information in decision making with empirical evidence. Calculating depreciation on medical equipment, Challenges in costing health and healthcare. Decision making using cost criteria, Cost Minimization

Teaching /Learning Methods:

Lectures, interactive contacts, and discussions

Assessment Strategy:

CA (Case studies, assignments, reports, presentations, tests) and ESA.

Continuous Assessment	Final Assessment		
30%	70%		
Details: Quizzes- 15, mid-term -15	Theory (%) 70	Practical (%) NA	Other (%)(specify)

			NA

References/Reading Materials:

- Millichamp, A.H., (1997)," Foundation Accounting", 5th edition, DP publications.
- Frank Wood, Alan Sangster (2012)," Business Accounting", Vol. II, 12th edition, pearson education.
- Panday I.M (2015), "Financial Management ", 12th Revised Edition, Vikas Publishing House (Pvt) Ltd, New Delhi.
- Journal of Accounting & Finance

Semester 1			
Course Code:	**MHEC 52082**		
Course Name:	**Foundation of Health Policy**		
Credit Value:	**2**		
Core/Optional	**Core**		
Hourly Breakdown	Theory	Practical	Independent Learning
	30		70

Course Aim/Intended Learning Outcomes:

On successful completion of this module, students will be able to:

- Understand the policy process
- Identify and analyze stakeholder interests
- Recognize key current issues on the Sri Lankan and global health policy agendas
- Locate sources of information guiding health policy content and process.
- Critically analyze policies
- Evaluate the implications of the political context of policy development
- Draw out the policy implications of research evidence and other forms of evidence
- Present well-informed, clear, and well-reasoned arguments on policy-relevant

questions

- Critically reflect on their learning about health systems policy and its application and/or future development
- Describe the different types of health technologies and demonstrate the different evidence requirements for regulation
- Recognize and describe the different stages of the HTA cycle (horizon scanning, prioritization, evidence assessment, policymaking, dissemination, and implementation)
- Demonstrate an understanding of the information and evidence requirements for healthcare policymaking in the context of new and existing health technologies.

Course Contents

Review of policymaking processes, key challenges and major issues confronting governments and health systems around the world and how policy can help address these. Foundation concepts in health policy, Health care delivery policies, global health and primary prevention policies. Policy formulation and policy evaluation, Identification of challenges and critical review of stakeholder involvement in the policy process. Policy analysis & implementation. Evidence-based policymaking, development of clinical practice guidelines.

The rationale underpinning the need for Health Technology Assessment (HTA); the history of the development of HTA; organizations, systems and approaches to HTA; and the differing perspectives of the role and use of HTA.

Teaching /Learning Methods:

Lectures, interactive contacts and discussions

Assessment Strategy:

CA (Case studies, assignments, reports, presentations, tests) and ESA.

Continuous Assessment	Final Assessment		
30%	70%		
Details: Quizzes- 15, mid-term -15	Theory (%)	Practical (%)	Other (%)(specify)

	70%	NA	NA

References/Reading Materials:

- Understanding Health Policy, A Clinical Approach. Thomas Bodenheimer, Kevin Grumbach.
- Health Policy Issues: An Economic Perspective. Paul J. Feldstein
- Prevention and control of selected NCDs in Sri Lanka-Policy Options and Action. 2010. Michael Engelgau, Kyoko Okamoto, Kumari Vinodhani Navaratne and Sundararajan Gopalan.
- Sri Lanka Code for Promotion, Protection, and Support of Breastfeeding and marketing of designated products.
- National MCH Policy.
- Reproductive Heath strategy – WHO Geneva.
- Community emergency preparedness: a manual for managers and policy-makers – WHO.
- Mental health policy of Sri Lanka, 2005-2015, Ministry of Health,
- Sri Lanka National Health Promotion Policy
- National policy on disability for Sri Lanka - Ministry of Social Services
- National Migration Health Policy Sri Lanka
- Website of World Trade organization- Legal text of GATS and TRIPS agreements- http://www.wto.org/
- Website of Third World Network- http://twnside.org.sg/fta.archives.htm
- Strategic plan 2016-2025 Ministry of Health

Semester 2	
Course Code:	**MHEC 52091**
Course Name:	**Reform and Development of Health Services**
Credit Value:	**1**

<table>
<tr><td>Core/Optional</td><td colspan="3">Core</td></tr>
<tr><td rowspan="2">Hourly Breakdown</td><td>Theory</td><td>Practical</td><td>Independent Learning</td></tr>
<tr><td>15</td><td></td><td>35</td></tr>
<tr><td colspan="4">Course Aim/Intended Learning Outcomes:
On successful completion of this module, students will be able to:
➢ Demonstrate an understanding of some of the drivers of reform at the 'system', 'institution' and 'care delivery' levels;
➢ Demonstrate an understanding of some of the mechanisms or approaches used in health service reform at the 'system', 'institution' and 'care delivery' levels;
➢ Describe some of the international and national agencies and entities that influence health service reform;
➢ Compare and contrast the reform agenda in a sample of developed countries;
➢ Reflect on the complexities and challenges involved in implementing reform;
➢ Think critically about the application of various reform movements/models at the 'care delivery' level.</td></tr>
<tr><td colspan="4">Course Contents
Reform and development in health services from an international, national and local perspective. Implementation of health policy reform and the multitude of issues, drivers, demands, complexities and consequent impacts related to reform. Areas of concentration include international and national governing entities, developed and developing country health systems, and various applications of reform movements/models in care delivery.</td></tr>
<tr><td colspan="4">Teaching /Learning Methods:
Lectures, interactive contacts and discussions</td></tr>
<tr><td colspan="4">Assessment Strategy:
CA (Case studies, assignments, reports, presentations, tests) and ESA.</td></tr>
<tr><td colspan="2">Continuous Assessment

30%</td><td colspan="2">Final Assessment

70%</td></tr>
</table>

Details: Quizzes- 15, mid-term -15	Theory (%) 70%	Practical (%) NA	Other (%)(specify) NA

References/Reading Materials:

- Department of Census and Statistics. (Latest Version). Sri Lanka Demographic And Health Survey (Latest Report Available).
- Annual Health Bulletin
- The World Bank (2012). Sri Lanka's Demographic Transition: Facing the Challenges of an Aging Population with Few Resources. . Available: http://www.worldbank.org/en/news/feature/2012/09/29/sri-lanka-demographic-transition. Last accessed 6th June 2013.
- Health Sector Reforms - World Bank Group, siteresources.worldbank.org/INTPSIA/Resources/490023.../3622-02_Ch02.pdf
- HEALTH SECTOR REFORM: Issues and Opportunities - World Health www.who.int/iris/bitstream/10665/127574/.../WP_HlthSecRefm_Final%20Version.pdf
- Chapter 6: Principal health reforms www.wpro.who.int/asia_pacific_observatory/hits/series/Hits_MNG_6_reforms.pdf
- USAID, USAID'S vision for health systems strengthening 2015-2019, (September 2015).
- Reimagining health reform in Australia: Taking a systems approach to ...https://www.strategyand.pwc.com/reports/health-reform-australia
- Health Sector Reform: Key Issues in Less Developed Countries apps.who.int/iris/bitstream/10665/59762/1/WHO_SHS_NHP_95.4.pdf health care systems: getting more value for money - OECD.org https://www.oecd.org/eco/growth/46508904.pdf

Semester 2			
Course Code:	**MHEC 52102**		
Course Name:	**Econometrics**		
Credit Value:	**2**		
Core/Optional	**Core**		
Hourly Breakdown	Theory	Practical	Independent Learning
	30		70

Course Aim/Intended Learning Outcomes:

On successful completion of this module, students will be able to:

- Understand the major theoretical and computational issues underlying analyses based on linear models.
- Develop appropriate regression modelling strategies based on unit matter considerations, including choice of models, control for confounding and appropriate parameterization.
- Be proficient at using a statistical software package to perform multiple regression.
- Understand the construction, use and interpretation of regression modelling diagnostics.
- Express the results of statistical analyses of linear models in language suitable for communication to medical investigators or publication in biomedical or epidemiological journal articles.
- Appreciate the role of modern techniques including non-parametric smoothing and variance components models.

Course Contents

Introduction to econometrics, Pearson correlation & partial correlation. Bivariate regression. Assumptions of linear regression and properties of least squares estimation (OLS). Evaluation

<table>
<tr><td colspan="4">of regression models (Simple and Multiple Regression). Standardized coefficients. Nonlinearity and interaction. Dummy (indicator) variables. Multi-collinearity. Model building strategies. Heteroscedasticity. Effect modification/interaction, together with the development of associated inference procedures. Multiple regression strategies and model selection issues will be presented together with model checking and diagnostics.
Conditional /Unconditional logistic regression for a binary outcome as a special case of generalized linear modelling.</td></tr>
<tr><td colspan="4">Teaching /Learning Methods:
Lectures, interactive contacts and discussions</td></tr>
<tr><td colspan="4">Assessment Strategy:
CA (Case studies, assignments, reports, presentations, tests) and ESA.</td></tr>
<tr><td>Continuous Assessment

30%</td><td colspan="3">Final Assessment

70%</td></tr>
<tr><td>Details:
Quizzes- 15, mid-term -15</td><td>Theory (%)

70%</td><td>Practical (%)

NA</td><td>Other (%)(specify)

NA</td></tr>
<tr><td colspan="4">References/Reading Materials:
Draper, N.R and smith, 3rd Edition, (1998), ‘Applied Regression Analysis’, John Wiley & Sons.
Michael Kutner , Christopher Nachtsheim , John Neter, William Li. Applied Linear Regression Models 5th Edition
Sanford Weisberg. Applied Linear Regression, 4th Edition. ISBN: 978-1-118-59479-7, John Wiley & Sons.
4. Hosmer D W, Lemeshow S, Rodney X. Sturdivant. Applied logistic regression 3rd Edition. John Wiley & sons New York 2013 ISBN: 978-0-470-58247-3</td></tr>
</table>

<table>
<tr><td>Semester 2</td><td colspan="3"></td></tr>
<tr><td>Course Code:</td><td colspan="3">MHEC 52111</td></tr>
<tr><td>Course Name:</td><td colspan="3">Forecasting</td></tr>
<tr><td>Credit Value:</td><td colspan="3">1</td></tr>
<tr><td>Core/Optional</td><td colspan="3">Core</td></tr>
<tr><td rowspan="2">Hourly Breakdown</td><td>Theory</td><td>Practical</td><td>Independent Learning</td></tr>
<tr><td>15</td><td></td><td>35</td></tr>
<tr><td colspan="4">Course Aim/Intended Learning Outcomes:
On successful completion of this module, students will be able to:
➢ Plot time series and describe their characteristics.
➢ Identify fundamental concepts in time series modelling, such as time series decomposition and stationarity.
➢ Compute indices based on time series data.
➢ Appraise the limitations of regression as a forecasting tool.
➢ Interpret forecast results for a general non-statistical audience.</td></tr>
<tr><td colspan="4">Course Contents
Range of forecasting methods and their application to planning and decision-making. Common tools and packages used in forecasting, the use of historical data to identify appropriate forecasting model, use the final model to forecast future values. The univariate analysis of time series (ARMA/ARIMA models). Multivariate time series analysis (VAR models).</td></tr>
<tr><td colspan="4">Teaching /Learning Methods:</td></tr>
</table>

<table>
<tr><td colspan="4">Lectures, interactive contacts, Practical classes and discussions</td></tr>
<tr><td colspan="4">Assessment Strategy:
CA (Case studies, assignments (written and practical), reports, presentations, tests) and ESA.</td></tr>
<tr><td>Continuous Assessment
40%</td><td colspan="3">Final Assessment
60%</td></tr>
<tr><td>Details:
Quizzes- 20, mid-term -20</td><td>Theory (%)
60</td><td>Practical (%)
N/A</td><td>Other (%)
N/A</td></tr>
<tr><td colspan="4">References/Reading Materials:
➢ Brockwell and Davis, 2nd Edition, (1991), ‘Time Series- Method and Forecasting’, Springer.
➢ Box and Jenkins, (1976), ‘Time Series Analysis’, John Willy.
➢ DeLurgio, S.A., (1998), ‘Forecasting Principles and Applications’, McGraw Hill.
➢ Chatfield, C., 2nd Edition, (1980), ‘Analysis of Time Series’, Chapman-Hall</td></tr>
</table>

<table>
<tr><td>Semester 2</td><td colspan="3"></td></tr>
<tr><td>Course Code:</td><td colspan="3">MHEC 52123</td></tr>
<tr><td>Course Name:</td><td colspan="3">Economic Evaluation</td></tr>
<tr><td>Credit Value:</td><td colspan="3">3</td></tr>
<tr><td>Core/Optional</td><td colspan="3">Optional</td></tr>
<tr><td rowspan="2">Hourly Breakdown</td><td>Theory</td><td>Practical</td><td>Independent Learning</td></tr>
<tr><td>45</td><td></td><td>105</td></tr>
<tr><td colspan="4">Course Aim/Intended Learning Outcomes:
On successful completion of this module, students will be able to:
➢ Demonstrate an understanding of the relevant issues associated with the appropriate</td></tr>
</table>

collection and analysis of cost and outcome data

- Demonstrate an understanding of the importance of discounting issues and the controversy surrounding the appropriate discount rate to use for costs and benefits within an economic evaluation
- Critically appraise a number of alternative frameworks and modelling approaches that are used in economic evaluation and understand the appropriate presentation of results
- Critically review alternative methods to outcome evaluation and their relevance to alternative evaluation approaches
- Recognise the policy implications that may result from economic evaluations Plot time series and describe their characteristics.
- Identify fundamental concepts in time series modelling, such as time series decomposition and stationarity.
- Compute indices based on time series data.
- Appraise the limitations of regression as a forecasting tool.
- Interpret forecast results for a general non-statistical audience

Course Contents

Importance of Economic Evaluation of Health Care. Measuring status of health and cost of illness. Different Techniques of Economic Evaluation; Cost-benefit analysis, cost-effectiveness analysis, cost-utility analysis. Calculating depreciation on medical equipment.

Practical modelling session: probabilistic sensitivity analysis and cost-effectiveness acceptability curves; valuing the broader benefits of health care.

A systematic review of economic evaluations; missing data analysis; critical appraisal of economic evaluation papers (group preparation).

Teaching /Learning Methods:

Lectures, interactive contacts and discussions

Assessment Strategy:

Continuous Assessment	Final Assessment

30%	70%		
Details: Quizzes- 15, mid-term -15	Theory (%) 70	Practical (%) NA	Other (%)(specify) NA

References/Reading Materials:

- Drummond M. F., Stoddart G. L. and Torrance (2015), Methods for the Economic Evaluation of Health Care Programmes; Oxford University Press.
- Sloan F. A. (1995), Valuing Health Care; Cambridge University Press.
- Gold M. R., Seigel J. E., Russell L. B., and Weinstein M. C. (1996), Cost-effectiveness in Health and Medicine, Oxford University Press.
- Arrow K. (1975), Social Choice and Individual Values
- Morris S., Appleby J. and Parkin D., Economic Analysis in Health Care.
- International Journal articles

Semester 2			
Course Code:	**MHEC 52131**		
Course Name:	**Applied Econometrics**		
Credit Value:	**1**		
Core/Optional	**Core**		
Hourly Breakdown	Theory	Practical	Independent Learning
	15		35

Course Aim/Intended Learning Outcomes:

On successful completion of this module, students will be able to:

- understand the principles of estimation and hypothesis testing in a multivariate setting

- know the properties of different estimators and tests
- be able to apply econometric techniques to actual data using computer packages
- be critically aware of the assumptions made in building econometric models
- write up the results of a study of an economic problem that includes econometric analysis
- proficiently use the time series testing and estimation capabilities of a range of packages
- explain the concepts used for the qualitative and limited dependent variables methods and apply them to simple situations.
- explain the concepts used for survival analysis and panel data models and to apply them to simple situations.
- use Stata to develop further your understanding of the syllabus material (T,P)

Course Contents

Specification and Data Issues; Functional form misspecification, Proxy variables, Measurement errors, Instrumental variables estimation, Econometric models with time series. Maximum Likelihood Principle, LP and Logit, Probit Models, Truncated and Censored Regression Models, Duration Models, Panel Data Models; Fixed effects estimation, Random effects estimation, Poisson regression model

Teaching /Learning Methods:

Lectures, interactive contacts and discussions

Assessment Strategy:

Continuous Assessment	Final Assessment		
30%	70%		
Details: Quizzes- 15, mid-term -15	Theory (%)	Practical (%)	Other (%)(specify)
	70	NA	NA

References/Reading Materials:

1. Wooldridge J.M. (2016) Introductory Econometrics, 6th Edition. Cengage Learning.
2. Angrist J.D. and Pischke J.S. (2008) Mostly Harmless Econometrics: An Empiricist's Companion. Princeton University Press.
3. Principles of Econometrics, 4th Edition, Wiley by R. Carter Hill, William E. Griffits and Guay C. Lim.

Semester 2			
Course Code:	**MHEC 52145**		
Course Name:	**Independent project related to Health Economics**		
Credit Value:	**5**		
Core/Optional	**Core**		
Hourly Breakdown	Theory	Practical	Independent Learning
		150	350

Course Aim/Intended Learning Outcomes:

On successful completion of this module, students will be able to:

- identify an issue or a problem related to health economic;
- critically review and evaluate the literature related to important health economics;
- integrate theory, knowledge and practice in their examination and appraisal of an important health economic issue in their workplace;
- demonstrate an ability to reflect on issues and alternative management actions;
- describe and justify appropriate action;
- demonstrate skills in writing up an assessment of an important health economic issue in a professional report.

<table>
<tr><td colspan="4">Course Contents
The unit is designed to consolidate the theoretical and practical skills acquired in the Master of Health Economics by exploring in detail a complex problem within their workplace or within a health care setting or community.</td></tr>
<tr><td colspan="4">Teaching /Learning Methods:
Lectures, interactive contacts, Practical classes and discussions</td></tr>
<tr><td colspan="4">Assessment Strategy:
CA (Case studies, assignments (written and practical), reports, presentations, tests) and ESA.</td></tr>
<tr><td>Continuous Assessment

30%</td><td colspan="3">Final Assessment

70%</td></tr>
<tr><td>Details:

Two Progress presentations – 15 each</td><td>Theory (%)

……..</td><td>Practical (%)

……..</td><td>Other (%) (specify)

Viva-voce examination %, Project Report %
70</td></tr>
<tr><td colspan="4">References/Reading Materials:
➢ JH Abramson, ZH Abramson, 1999. Survey methods in Community Medicine.
➢ 2. Designing clinical research: an epidemiological approach, SB Hulley, SR Cummings. 1988</td></tr>
</table>

Contributors to the development of the curriculum

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5). Dr. Anuji Gamage

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6). Dr. (Mrs) A. P. Hewaarachchi

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7). Dr. (Mrs.) D. D. M. Jayasundara

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8). Dr. W.V.A.D Karunarathne

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9). Senior Professor R.P Chitra Ranjani

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B. Com – University of Kelaniya

10). Dr. Sudath Samaraweera

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Nutrition and Indigenous Medicine

11). Dr. S.D. Viswakula

B.Sc. (Statistics) (Colombo, M.Sc (Texas El Paso U.S.A), PhD (Old Dominion, U.S.A)

Department of Statistics, University of Colombo

Date : …….. ……

Chair of the BoS in Multi-Disciplinary Studies

Date : ……. ……

Dean of the Faculty of Graduate Studies

Recommendation of IQAU Director of the University

Date : …….. ……

Director- IQAU, University of Kelaniya

Approval of the Vice-Chancellor

Date : …….. ……

Vice-Chancellor -University of Kelaniya