Master of Economics
(Environmental Economics)

Prospectus

Session: 2024-25

Dhaka School of Economics
(*Constituent Institution of the University of Dhaka*)

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(*Constituent Institution of the University of Dhaka*)

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PART-I: INTRODUCTION

1.1 About Dhaka School of Economics (DScE)

The newly established Dhaka School of Economics (DScE), a Constituent Institution of the University of Dhaka, has begun its journey on 8 April 2010 aspiring to promote advanced studies and research in economics and other related disciplines to cater to the fast growing demand for well-trained economists and professionals, particularly in the areas of applied environmental and development economics and in related areas to contribute to teaching, research and evaluation, policy making and implementation of nation-building programmes for the fast expanding economy of Bangladesh. Apart from its main focus on teaching and research, the School is also committed to establishing a 'data-bank', with easy access for those who intend to engage themselves in economic research and policy analysis.

To achieve these targets, Dhaka School of Economics sets out its vision to establish it as a 'Centre of Excellence' for advanced teaching and research in economics in line with London School of Economics and Political Science (LSE) and Delhi School of Economics (DSE), for example. More specifically, the school targets to continue its activities to fulfill the following missions:

- To deliver challenging, stimulating and research-oriented academic programmes in an environment that facilitates learning and development of independent critical thinking among the students.
- To ensure, through critical self-reflection, that its teaching and research remain at the forefront of economics and related disciplines, addressing the evolving challenges of the contemporary society.
- To make the institution internationally competitive and establish it as a 'Centre of Excellence' for advanced study and research in economics and related disciplines.
- To establish and intensify interactions with society in Bangladesh and leading academic institutions in different parts of the world.

The School is currently being housed in the Bangladesh Economic Association (BEA) Building at Eskaton Garden Road, Dhaka. The place is free from noise and transport hazards. DScE aspires to shift to its permanent campus at Purbachal in the course of time.

1.2 Academic Programmes

DScE has formally started its teaching programmes from the academic session, 2011-12, with the following two programmes:

- Post Graduate Diploma in Economics; and
- Master of Economics (Environmental Economics)

The classes of the first batch of Post Graduate Diploma in Economics started on February 26, 2012 whereas the Master of Economics (Environmental Economics) classes started on 10 April 2012. Following the successful completion of the first 11 batches of students of the Master of Economics (Environmental Economics), the last admitted students of the 12^{th} batch are now in their 2^{nd} semester of studies. In the meanwhile, DScE also has started another three postgraduate programmes: Master of Economics (MEcon) in Development Economics from the academic year 2013-14; Master of Economics (Entrepreneurial Economics) programme from session 2017-18 and Master of Environmental and Resource Economics from 2019-20. Under the Development Economics Programme, total 10 batches have already been admitted, of which 8 have successfully completed their studies. Similarly, under the Master of Environmental and Resource Economics programme, primarily designed for those who have successfully completed their Bachelor of Economics (BEcon) in Environmental and Resource Economics (ERE) from DScE, a total of three batches have been admitted.

In line with DScE's success in postgraduate studies and to meet the increasing demand for trained manpower in the field of environmental and resource economics, the School has started a specially designed undergraduate programme: *Bachelor of Economics (BEcon) in Environmental and Resource Economics* for the first time in South Asia from the academic session 2015-16. Under this programme the seventh batch of students has recently been admitted by the School. The School has also started another two specialized Bachelor programmes i.e. Bachelor of Economics (BEcon) in Development Economics and Bachelor of Economics (BEcon) in Entrepreneurial Economics.

DScE focuses on the application of theoretical, methodological and applied research-

oriented approaches so that the students can acquire in-depth knowledge and understanding of the subjects studied. As a result, the students can confidently apply the knowledge and experiences gained in their respective fields to cope with the fast changing circumstances of a growing economy and an evolving society like Bangladesh. Special focus, thus, is given on applied economics, along with computer applications, besides endowing students with a strong theoretical understanding on the courses taught.
In addition to the formal class lectures, the School also organizes regular seminars, extension lectures and open discussions on various issues of contemporary interests, including socio-economic, environmental and other multidisciplinary issues with strong involvement of students, scholars and faculty members. This helps the students/scholars to improve their knowledge and practical understanding on diverse economic and related issues through interaction with a large number of specialists and experts from home and abroad from various fields.

Other masters and research degree programmes, including MPhil and PhD, shall be introduced in phases. Specialized diploma and certificate programmes may also be introduced in the coming years.

1.3 Research Programme

Dhaka School of Economics (DScE) cherishes the philosophy of 'spreading advanced teaching and research in economics' for a fast growing economy like Bangladesh to deal with the challenges the country is increasingly facing in relation to the production of quality graduates and economists. In this regard, research and evidence-based teaching are given very high emphasis.

A focus of DScE's applied economics research programme is to contribute to poverty eradication through multi-directional and multi-disciplinary applied research and giving special emphasis on relevant subjects. Climate change, environment, water and other emerging development challenges are given proper attention. Currently, a multi-dimensional and inter-disciplinary research programme is being developed, where such concerns will be given special emphasis through research. DScE's research programmes

are being carried out, mostly by its own faculty members. A number of research projects have been carried out by DScE since the beginning of its academic activities.

Besides these, a number of other research project proposals are currently being developed by Dhaka School of Economics under its multi-disciplinary research programme.

1.4 Library

DScE has set-up its own modern library and has procured a considerable number of important text books, reference books, research publications and periodicals from home and abroad. The School has given the highest priority on purchase of quality books. A good collection of text and reference books on environmental and development economics, including the most widely refereed and recent textbooks, are also available in the DScE Library. It has also successfully collected sufficient digital resources, including access to numerous journals on economics, environmental economics and other disciplines of social sciences, on-line books and other study materials suitable for students and researchers. In addition, the School has a secured access to over 500 refereed journals of economics, environment and development studies.

1.5 Data Centre

Data deficiency, unavailability of data in required formats and limited access to data as required for various purposes are some of the major problems in conducting research and policy analysis in most developing countries, including Bangladesh. In order to overcome such challenges and to create an atmosphere for more economic research and analyses, DScE has started to establish a state of the art data bank. Data on various socio-economic, environmental and other development indicators will be collected, analyzed, categorized and stored. Apart from this, important secondary data will also be organized, stored and made available to all in a user-friendly way so that interested researchers could conduct research and policy analysis much hurdle. The school may also try to explore the

possibility of joining with other similar institutes and organizations that work on data and get access to their data resources.

It is expected that besides DScE's own students, faculty members and researchers, other economists, policy makers, researchers, investors and freelance researchers from Bangladesh would be benefited from the data bank through user-friendly data accessibility on issues of diverse economic interests.

1.6 Governing Council of DScE

Chairman

Dr. A. K Enamul Haque
Deputy Vice Chancellor
UCSI University, Bangladesh Branch

Member Secretary

Director
Dhaka School of Economics

Member

Dr. Firdousi Nahar
Professor, Department of Economics
University of Dhaka

Shabnaz Amin
Professor, Department of Finance
University of Dhaka

Dr. Shamsun N. Ahmed
Professor (Retd), Department of Economics
University of Dhaka

Dr. Serajul Hoque
Professor, Department of Marketing
University of Dhaka

Dean
Faculty of Social Sciences , University of Dhaka
Dhaka – 1000

Dr. Narayan Chandra Sinha
Associate Professor, Dhaka School of Economics

Tonmoy Chowdhury
Assistant Professor, Dhaka School of Economics

Part-II: Master of Economics (Environmental Economics) Programme

2.1 About the Master of Economics (Environmental Economics) Programme

Master of Economics (Environmental Economics) is a specially designed 4-semester long post graduate programme, where the students have to complete studies for 1300 marks (equivalent to 52 credit hours, of which 4 credit hours are assigned for each of the courses while 8 credit hours for dissertation). Each of the first three semesters is of four-month long, while the last and final semester lasts for six months. For each of the first three semesters, students have to complete 12 credit hours equivalent three compulsory courses, whilst the last semester is of 16 credit hours (equivalent to four courses).

The students are expected to brush up and learn basic economic theories and methods along with necessary mathematical techniques in their first semester, while they will be exposed to advanced and up-to-date theories, techniques and tools of statistics, welfare economics and environmental economics in their second semester. The third semester will help out the students to learn advanced theories on economics of environmental policy and regulation, environmental valuation and decision making tools and sustainable development. This semester is designed to allow the students to gain knowledge on required economic tools and techniques to assess environmental policies and evaluate environmental impacts for informed decision making. This will be followed by another two compulsory courses in the last and final semester where students will have hands on training in advanced research methodology and knowledge on ecological, resource and energy economics. A few of the students will also be allowed to write an end of the programme dissertation on any aspect of environmental economics using the newly acquired methods and techniques. For those who will not get a chance to opt for writing dissertation, the School offers them to learn two taught courses chosen from the currently available three optional papers: economics of climate change, trade and environment and project planning and evaluation to enable them to get acquainted with the latest knowledge and up-to-date theories and practices on these subjects. DScE gives due focus on the applied economic issues in addition to a strong theoretical learning for its students.

Experiences of the first ten batches of students of this programme have been quite encouraging. Besides interactive and useful classroom lectures and discussions, the overwhelming enthusiasm of the students in choosing diverse, but relevant and contemporary research topics for their dissertation is a high interest area. Some of the recently completed dissertations (out of the 70+ completed dissertations) include:

- Economic valuation of recreational sites- tiger conservation (the Royal Bengal Tigers), managing zoological garden, creational wetlands (Foy's Lake);
- Economic valuation and importance of wetlands (*beels* and *haors*);
- Economics of improved drinking water services in the face of climate change and water scarcity;
- Economic impacts of reduced water flow in the Teesta River of Bangladesh;
- Assessing water poverty indices for selected climatic vulnerable countries;
- Climatic impacts on different economic sectors;
- Climate-induced migration and displacement;
- Assessment of district-level climatic vulnerability in Bangladesh;
- Costs of child diarrhoeal disease and water-borne diseases of urban slums;
- Economics of sanitation services and health costs;
- Economics of ship-breaking industries and health hazards;
- Economics of pre-paid metering system of supplied cooking gas for Dhaka city;
- Linkage between environmental sustainability and economic growth;
- Evaluation of green banking and project financing;
- Costs of water-logging problem of the South-western districts of Bangladesh;
- Bangladesh's trade in climate smart goods- trends, patterns and determinant;
- A scoping study on the possibility of undertaking green fiscal policy in Bangladesh;
- Role of transport sector for the economic growth of Bangladesh;
- Economic instruments in controlling waste water by textile industry of Bangladesh;
- Dynamics of rural land market in recent years in Bangladesh;
- Economics waste management and electronic waste management in Bangladesh;
- Economics of rural electrification in Bangladesh;
- Economic loss due to topsoil degradation from brick fields in Bangladesh;
- Economics of fish fry collection: a case of Halda River;

- Economics of saline water intrusion in the coastal rivers on prone-cultivation;
- Economics of rainwater harvesting for Dhaka city;
- Economic and environmental costs of tobacco cultivation in the CHT areas;
- Economics of the loss of urban wetlands;
- Economics of potable water collection in the coastal areas against climate change;
- Economics of introducing transferable development rights (TDR) in the semi-urban areas of Bangladesh;
- Economics of early warning system in the hazardous areas of Bangladesh
- Comparative analysis of rail and roadways in terms of economic, environmental and health safety;
- Economic and environmental issues concerning stone-lifting in environmentally fragile areas of Bangladesh;
- Water Use Efficiency with Micro-Irrigation: A Case Study of Drip Irrigation System in Jessore;
- Effective Management of Wetlands: Challenges to Meet up the Sustainable Development Goals;
- Cost of Waterlogging in Chottogram City: A Case Study of Halishahar Residential Estate;
- Development of Environmental Protection Index (EPI) for Transportation Infrastructure Projects;
- Assessment of Air Quality and Health Impact for Air Pollution: A Case Study of Greater Dhaka Metropolitan Area;
- A Comparative analysis of environmental scenarios before and after completion of the Padma multipurpose bridge project;
- Environmental Cost of Traffic Congestion: An Evidence from Dhaka City, Bangladesh;
- Assessing Morphological Transformation of Agricultural Land for Residential Purpose: An Economic Analysis,
- Energy Security for Economic Development: The Cost of LNG Imports by Bangladesh;
- Economics of Being Green: A Case Study of the Ready-made Garments Industry of Bangladesh and so on.

The Master of Economics (Environmental Economics) programme of DScE aims to excel not only in theory-based studies, research-oriented and applied learning and publications are equally encouraged under this programme. It is to be mentioned here that over sixty five MS dissertations have been completed under this programme until the 9th batch, while dissertation works for the tenth batch are currently undergoing. This speaks the seriousness on the part of the students in this programme and also is a great motivation for the School. It is really encouraging that a number of students of this programme have published their research works in peer reviewed and refereed journals, from home and abroad. Further, a number of graduates from this programme have received prestigious fellowships/scholarships and are currently studying in different universities in the North America, Europe and Australia. With time, this programme is expected to make a stronger mark in the area of environmental economics.

It is expected that upon completion of this programme, a student will acquire advanced theoretical and methodological knowledge and understanding on environmental economics with academic depth and professional skills, which is expected to enable her/him to understand the nature of the environmental challenges, deal with them in an appropriate manner from both theoretical and practical points of view. Given environmental challenges, fast running down of natural resources along with their expanding demands, utmost care should be given on how to deal with such challenges efficiently without compromising real economic growth and development. This would require internalizing environmental concerns in our national planning and development decisions. The basic aim of this programme is to create human capabilities aimed at fulfilling this requirement.

2.2 Salient Features of the Programme

Master of Economics (Environmental Economics) programme of DScE has the following features:

- Total 52 credit hours (or equivalent to 1,300 marks).
- Total 4 semesters over 18 months, out of which the first three semesters will be of four months each and the final one is set for six months.

- There are 11 compulsory papers (1,100 marks or 44 credit hours). Further, some selected students may also get the opportunity to complete a dissertation carrying 200 marks (or 8 credit hours) on any aspect of environmental economics in their final semester of study instead of two optional papers but the students who will score at least a CGPA of 3.75 on a 4.0 scale in their first three semesters will only get the chance to write dissertation; but the School, in certain exceptional cases, may allow a student to choose writing a dissertation instead of the optional courses (any change in the guidelines by Dhaka University for Master's dissertation will be applicable in this regard).
- For completing this programme, a student has to study a total of 1300 marks or its equivalent of 52 credit hours. Of which, 1100 marks (44 credit hours) are compulsory and the remaining 200 marks (8 credit hours) are optional.
- English is the medium of instruction.

2.3 Eligibility Criterion & Admission in Master of Economics (Environmental Economics) Programme of DScE

For the admission to Master of Economics (Environmental Economics) programme, the School has set up the criterion that a candidate should have at least a Bachelor (4 Years) and/or Masters degree from a recognized university or an equivalent institution with good academic records (no 3rd class/division at any level) in the following subjects:

√ Any area of economics (e.g. economics, environmental/resource economics, etc.);
√ Mathematics/Applied Mathematics;
√ Statistics/Applied Statistics;
√ Engineering with at least one course in economics;
√ Environmental Management/Science with at least one course in economics
√ Any other discipline with at least a course in economics.

In certain exceptional cases, students may also be admitted from other disciplines, but they need to perform exceptionally well in the admission test. For those who have passed their qualifying examinations from outside Bangladesh or from any private university of Bangladesh, equivalence is needed. Those who are in fulltime job are required to submit

permission from their employers that they will be allowed to attend classes regularly. A student already admitted or continuing a fulltime academic programme is not eligible to apply for this programme.

2.4 Selection Process

The selection criteria comprise both written test and interview of the short-listed candidates. The written test may include short answers, focus writing and problem solving on basic economics (microeconomics, macroeconomics, development economics, public finance, etc.), quantitative methods (statistics, and mathematics) and elementary environmental issues. The School reserves the right to change its admission procedure/ criterion and may take both written and interview or only one of the two for the selection of the students to this programme. Any decision made by DScE will be the final.

2.5 Evaluation and Grading[1] System

Evaluation and grading for all theoretical papers (non-dissertation courses) shall be determined as per the rules of the University of Dhaka. These include:

- Semester final examination
- Term papers and assignments
- Class attendance and
- Active participation in class /tutorial /group discussion and class tests

Figure-2.5.1: Distribution of Marks for Evaluation for Master of Economics (Environmental Economics) Programme is as follows[2]:

Evaluation Criterion	***% of Marks***
Class Attendance	10
Active participation in class discussion/tutorial class/group discussion and class tests	20
Submission of term papers and assignments and presentation	20
Semester final examination	50
Total	***100***

[1] This section is prepared in line with the guidelines of the Faculty of Social Sciences of the University of Dhaka (DU).
[2] Any change in DU Guidelines applicable for DScE in this regard shall automatically be applicable here.

For each course, the average marks awarded in the semester final examinations and sessional marks awarded by the course teacher for class attendance; term papers and assignments; and class performance based on active participation in class discussions, tutorial classes and class tests shall be totalled and converted into equivalent letter grades following a 4-point grading scale as shown below:

Figure-2.5.2: Grading Structure for the 4-Point Grading Scale for Master of Economics (Environmental Economics) Programme:

Mark Range (in %)	***Letter Grade***	***Explanation***	***Grade Point***
80 and above	A+	Excellent	4.00
75 to less than 80	A		3.75
70 to less than 75	A-		3.50
65 to less than 70	B+	Very Good	3.25
60 to less than 65	B		*3.00*
55 to less than 60	B-		*2.75*
50 to less than 55	C+	Good	*2.50*
45 to less than 50	C		*2.25*
40 to less than 45	D	Pass	*2.00*
Below 40	F	Fail	*0.00*
……	I		*Incomplete*
……	W		*Withdrawal*

- 'F' grade is indicative of an unacceptable 'failing' performance overall by a student, i.e. fail to earn any credit. If a student, in certain exceptional cases, fails to appear a course final examination (maximum one course in a single semester) and if the Examination Committee recommends her/his case to the University of Dhaka, then the case will be considered as 'F' grade. In such a case, a student shall be required to appear the semester final examination for the course(s) she/he fails with the next batch without fine for every course she/he appears (upto two courses maximum in a single semester).

- 'I' grade is indicative of a situation where a student, for any non-academic reason beyond his control, is unable to complete the full requirements of the course for not being able to sit for the semester final examination. With the submission of valid and authenticated evidence of such reason(s), and the recommendation of the course teacher (to be reported to the Chairman of Examination Committee), that particular student shall be allowed to complete the semester final examination with the next batch. Meanwhile, the student concerned will be promoted to the next semester. If an

'incomplete' grade (Grade 'I') is not cleared with the next batch, the 'I' grade shall automatically be changed into an 'F' grade (fail). A maximum of two 'I' grades shall be allowed to a student in one semester. In such a case, a student shall be required to pay the normal fee without fine for every course she/he appears (upto two courses maximum in a single semester).

- 'W' grade (withdrawal) shall be awarded when a student is permitted to withdraw/ drop a course/ semester without fine. Withdrawals without fine are not permitted after two months of any semester started. A student may take re-admission in the semester concerned with the next batch by paying the full fees for that semester.

2.6 Promotion / Improvement/ Readmission/ Drop-out Policies[3]

Promotion

- For promotion from the first to second semester, a student shall have to earn a minimum SGPA of 2.00.
- For promotion from the second through the final semester, a student shall have to earn a minimum CGPA of 2.25, taking into consideration all the grade points earned in total number of courses of first through the final semester and improved grade, if any.
- A student failing to clear up the annual University of Dhaka and DScE dues of the year of the study shall not be promoted to the next semester, as prescribed.

Improvement/Repeat

- A student earning 'F' grade in any course shall be allowed to improve the grade with the next batch without fine.
- If a student obtains a grade lower than 'B-' (B Minus) in a course, she/he shall be allowed to repeat the semester final examination only once with the immediate next batch for the purpose of grade improvement by forgoing her/his earlier term final marks. In such a case, sessional marks earned by the student shall be remained same and only the semester final grade can be improved.

[3]This part is prepared in line with the guidelines of the Faculty of Social Sciences of the University of Dhaka (DU). Any change in the DU guidelines will be applicable in this case.

- If a student obtains ‘B-’ (B Minus) or better grade in any course, she/he shall not be allowed to repeat the course for the purpose of grade improvement.
- If a student likes to improve the grade point earned in a course of the 4th semester (in case, if she/he scores less than B Minus in a course), she/he must apply for such improvement examination before the certificate is issued. In such a case, a student shall be allowed to appear the grade improvement examination within the next 45 days of publication of the final result. In such a case, a student shall be required to inform DScE in written her/his intension to improve the grade within 7 days of the publication of her/his final result.
- Improvement shall not be allowed once the certificate is issued.
- A student carrying ‘F’ grade in any course shall not be awarded the degree unless she/he improves it by appearing at the semester final examination with the next batch.
- If a student gets ‘F’ grade in the improvement examination, she/he shall automatically be dropped from the semester and the student shall have to take re-admission with the next batch, provided the student concerned is eligible for re-admission.
- For improvement of grade in a course, the student shall apply to the Director of Dhaka School of Economics (DScE) at least 4 (four) weeks before the start of the semester final examination.
- A student shall be allowed to improve the grade of a particular course only once.
- No student shall be allowed to improve the grade of any term paper/assignment, active participation in the class discussion/tutorial class/ group discussion/class test marks and the grade earned in the written or oral (if any) comprehensive examination i.e. no improvement shall be allowed for sessional marks/grades once awarded to a student for any course in a semester, but semester final examination can be improved if requires.

Re-admission

- A student failing to get the necessary grade points for promotion from one semester to the next may seek re-admission to with the following batch.
- For re-admission, a student shall have to apply within one month after the announcement of result of the concerned semester.

- On re-admission, grades earned earlier by a student in the class of re-admission shall cease to exist and the student has to retake all the course works and examinations.
- A student shall not be allowed re-admission in more than two semesters during the total time span (18 months) of the Masters in Environmental Economics programme.

Drop Out

- A student failing to earn the GPA for promotion from one semester to the next after taking the re-admission in any semester shall be dropped from the Master of Economics (Environmental Economics) programme of DScE.
- A student earning 'F' grade in any course after taking re-admission or improvement examination(s) in any semester shall be considered dropped out from the Master in Economics (Environmental Economics) programme of DScE.

2.7 Fee Structure of the Master of Economics (Environmental Economics) Programme

The 'Academic Council' of DScE has decided a comparatively lower fee structure for this programme to encourage bright students. It includes fees both payable to DScE and University of Dhaka. The fee structure for the Master of Economics (Environmental Economics) programme for the academic session 2023-24 has been set as follows:

Sl No	**Particulars**	**Total Amount**	**Amount** (Admission & 1st Semester fee)	**Amount** (2nd-4th Semester) **Each Semester**
	University of Dhaka fees **(**Subject to Change**)** **A**			
1	Migration fee for non DU Students	5000.00	5000.00	
2	Registration fee for non DU Students	1000.00	1000.00	
3	Final exam fee	8000.00	2000.00	2000.00
4	Transcript	1800.00	450.00	450.00
4	Exam entry fee	400.00	100.00	100.00
5	Sub: Total Amount =	**16200.00**	**8550.00**	**2550.00**
	Dhaka School of Economics: B			
1	Admission fee	3000.00	3000.00	0.00
2	Library Fee	3000.00	3000.00	
3	Examination Centre fee	8000.00	2000.00	2000.00
5	Tuition fees for whole course	68640.00	17160.00	17160.00
6	Computer Laboratory fee	6000.00	1500.00	1500.00
7	Class test/tutorial examination fee	4000.00	4000.00	0.00
8	Miscelleneous	4000.00	4000.00	0.00

9	Library Caution Money (Refundable)	1000.00	1000.00	0.00
10	ID Card (only admission time)	0.00	140.00	0.00
	Sub: Total Amount =	**97640.00**	**35800.00**	**20660.00**
	Total Amount =	**113840.00**	**44350.00**	**23210.00**

- *Payment for admission form and prospectus (Tk.1,000.00) is to be made in cash.*
- *Fees for the whole programme may be paid at a time of admission or in four installments maximum*
- *Student shall have to pay an additional Tk. 1000/-(one thousand) as library caution money at the time of admission which is refundable.*

*DU Passed graduate wiil pay less amount of TK. 6,000/- (Six thousand only)

2.8 Course Structure of the Master of Economics (Environmental Economics) Programme

The course structure of Master of Economics (Environmental Economics) programme of Dhaka School of Economics is as follows[4]:

Semester	***Courses Covered***	***Credits***	***Semester Focus***
1st	C-101: Microeconomic Analysis C-102: Macroeconomic Analysis C-103: Mathematical Methods for Economics	4 4 4	Fundamentals on basic economic theories and quantitative techniques
2nd	C-201: Welfare Economics and Public Policy Analysis C-202: Statistical Methods and Econometrics C-203: Environmental Economics—Theory and Practices	4 4 4	Advanced theories on welfare economics, statistical and econometric techniques and core issues and theories of environmental economics
3rd	C-301: Economics of Environmental Regulation C-302: Environmental Decision Making C-303: Economics of Sustainable Development	4 4 4	Economics of environmental regulation and policy analysis, valuation of environmental services, public policy analysis and sustainable development
4th	C-401: Research Methodology and Computer Applications in Environmental Economics C-402: Introduction to Resource, Ecological and Energy Economics C-403: Dissertation C-404: Economics of Climate Change C-405: Trade and Environment C-406: Project Planning and Evaluation	4 4 8 4 4 4	Applied research and research methods, tools for development project analysis and advanced economic theories on related areas of concerns
Total Grades Required to Complete the Programme		**52**	

In addition to the above-mentioned courses and a dissertation (optional), the students will also be required to write term papers, review research articles/books and give class presentations on a regular basis. Furthermore, students will also be required to attend all

[4]In addition, there will be a few non-credit lectures on Emergence of Bangladesh and its current socio-economic status at the beginning of the programme.

extension lectures or special lectures organized on economic and environmental issues and actively participate in discussions and debates.

2.9 Syllabus of Master of Economics (Environmental Economics) Programme

Master of Economics (Environmental Economics) programme is designed to provide students with both theoretical and applied training in environmental economics to face the growing demand for trained graduates in the area of economics of the environment. Besides, a special focus of this programme is to understand and analyse diverse development and environmental challenges that Bangladesh as well as the South Asian region is currently facing or going to be exposed in near future to understand economic approaches to resolve them efficiently. It is expected that upon completion of the pogramme, a student will develop the required theoretical approaches and quantitative analytical skills to deal with such challenges with maximum efficiency.

As mentioned, Master of Economics (Environmental Economics) programme is designed to be run in four semesters where the first three semesters will be of four months each followed by a six-month long final semester. In the first semester, the students are expected to refresh/learn intermediate-level microeconomics and macroeconomics along with intermediate to advanced-level understanding of mathematical economics. The second semester will be devoted to advanced studies on welfare economics, statistics and econometric techniques, in addition to a paper on the core theories of environmental economics. This will be then followed by courses on economics of environmental regulation and policy, environmental valuation as well as sustainable development in the third semester of studies. In the last and final semester, all students will be required to complete two mandatory courses: research methodology and computer applications in environmental economics and basics of resource, ecological and energy economics. Besides, they also will be needed to complete another 8 credit hours equivalent courses, either by writing a dissertation (only for selected candidates who will score 3.75 or above on a 4.0 scale on an average in the first three semester of studies) or by studying two optional courses out of the three currently offered courses[5].

[5] Offer is subject to availability.

Semester-wise detailed syllabus, course curricula and basic references for each of the courses are given below:

2.9.1 First Semester

The first semester of the Masters programme in Environmental Economics comprises three fundamental courses on basic microeconomics, macroeconomics and mathematical methods for economics. These courses are designed to form a solid basis for introducing advanced theories and methods of environmental economics for the semesters that will follow. Upon completion of this semester, students are expected to be well-equipped with the required knowledge of economic theories and mathematical techniques that are used in advanced environmental economics studies and research. The detailed course contents are given below:

C-101: Microeconomic Analysis

Introduction:

This course comprises major theories of microeconomics i.e. consumer theories, theories of firm, market theories and introductory game theoretic applications in economics. The focus of this course is to introduce the students with intermediate-level theories of microeconomic analysis which are linked to environmental economics.

Course Contents:

Consumer Theory: concept of demand, supply and equilibrium, elasticity, preferences, utility, indifference curves, budget constraints, optimization techniques, income and substitution effects, Slutsky equation, consumer and producer surplus, compensating and equivalent variation and consumer behavior under uncertainty.

Production and Cost functions: Concept of production and production function, production with one variable input and production with two variable inputs, returns to scale; measuring cost, cost in short run and long run, cost minimization, dynamic changes in costs- the Learning Curve.

Market and Imperfection: Concept of market in economics, perfect competition vs. imperfectly competitive markets; pricing with market power: monopoly, monopolistic

markets, and oligopoly; economic efficiency, resource allocation, and the role of government.

Game Theory and Competitive Strategy: Gaming and strategic decisions; dominant strategies, the Nash Equilibrium, repeated games, sequential games, games with perfect/incomplete information and zero sum games.

Suggested References:

■ Pindyck, Robert S; Rubinfield, Daniel L. and Mehta, Prem L., "Microeconomics", Pearson, Seventh Edition, 2009

■ Mas-Colell, Andreu; Whinston, Michael D. and Green, Jerry R, "Microeconomic Theory", Oxford University Press, First Indian Edition, 2006

■ Henderson, James M. and Quandt, Richard E., "Microeconomic Theory- A Mathematical Approach", Tata McGraw-Hill Edition, 2003

■ Varian, Hall R. "Microeconomic Analysis", W. W. Norton & Com, Third Edition, 1992

■ Varian, Hall R., "Intermediate Microeconomics: A Modern Approach", W. W. Norton & Company, 8th Edition, 2009

■ Nicholson, Walter and Snyder, C. M., "Intermediate Microeconomics", 2009

■ Kourtsoyianis, "Modern Microeconomics", New York: Palgrave Macmillan, 1982

C-102: Macroeconomic Analysis

Introduction:

This course is designed to cover intermediate to advanced level studies on macroeconomic theories and applications, which are useful in the studies of environmental economics. It is expected that upon completion of this course, students will have gained an understanding on the required knowledge of macroeconomic theories and tools to comprehend and analyze the economics of the environment.

Course Contents*:*

Basic Concepts of Macroeconomics: Macroeconomics and its subject matters; production possibility curve, opportunity cost and law of increasing opportunity cost; stocks and flows; static, comparative statics and dynamics.

Measurement of Economic Performance: Circular flow of income and expenditure; gross domestic product-definition, components, methods of estimating GDP, GNP and national income, problems with GDP estimation, real vs. nominal GDP and GDP deflator; GDP as an indicator of economic well-being and its weaknesses

Determination of Output, Income and Employment: Classical theory of output, income and employment determination; Keynesian theory of output, income and employment determination; Aggregate demand (AD) and aggregate supply (AS): AD and AS curves in the short and long run, long run vs. short run macroeconomic equilibrium and adjustments, MPC and MPS; AD and AS shocks and its impacts on the economy; the autarky economy with and without government, consumption and saving functions, the multiplier; unemployment.

Fiscal Policy and Monetary Policy: Introducing fiscal policy, instruments of fiscal policy, effectiveness of fiscal policy; budget-concepts, types and elements, budget deficit and surpluses, crowding out effect; money and banking, roles of a central bank and commercial bank, central bank and monetary policy instruments; inflation and the Phillips curve.

Suggested References:

■ Mankiw, N. Gregory, "Principals of Macroeconomics"; 6th Edition, 2011

■ Shapiro, Edward J. "Macroeconomic Analysis", 2nd Edition, New York, 1982

■ Dornbusch, R., Fischer, S. and Startz, R., "Macroecon0mics", McGraw-Hill Higher Education, 2007

■ Froyen, R. T., "Macroeconomics: Theories and Policies", Pearson Education, 1998

■ Romer, D., "Advanced macroeconomics", 3rd Edition, McGraw-Hill Companies, 2001

C-103: Mathematical Methods for Economics

Introduction:

In today's world, none can imagine of studying economics without a solid understanding of mathematics. The same is true for environmental economics. With this realization, this course is developed to make the students acquainted with advanced mathematical tools and techniques that are widely used in environmental economics.

Course Contents:

Linear Algebra: Linear systems, matrix algebra, linear independence and basis, vector spaces, linear transformations, the determinant function, Eigen values and Eigen vectors, inner product and norms.

Calculus and Optimization: Open sets, closed sets, compact sets; derivatives and rules of differentiation, use of differentiation in economics; unconstrained optimization and constrained optimization, envelop theorems, comparative statistics.

Dynamic Analysis: Integration, first and second order differential equations, systems of differential equations, optimal control theory.

Suggested References:

■ Simon C.P., Blume L., "Mathematics for Economists", W.W. Norton & Company, 1994

■ Chiang, A.C., Wainwright, K., "Fundamental Methods of Mathematical Economics", 4th Edition, 2005

■ Dowling, E.T. "Introduction to Mathematical Economics", Schaum's Outline Series, 3rd Edition, 2000

■ Rangarajan, K.S. "A First Course in Optimization Theory", Cambridge University Press, 2014

■ Simmons, G.F., Robertson J.S., "Differential Equations with Applications and Historical Notes", 2nd Edition, McGraw-Hill, Inc., New York, 1991

2.9.2 Second Semester

This semester is specially designed to train the students on the core areas of welfare economics and environmental economics—both theories and applications, besides developing their foundations on basic statistics and econometric techniques required for environmental economics. It is expected that upon completion of these three main courses viz. welfare economics and public policy analysis, environmental economics, and statistical methods and econometric techniques, the students will be well-versed on these subjects, which will enable them to assess development challenges critically by considering the economics of the environment and make right choices in their professional lives.

C-201: Welfare Economics and Public Policy Analysis

Introduction:

Knowledge of welfare economics, and particularly applied welfare theory, is essential in the study of economics of the environment to the provision of useful and appropriate policy information concerning environment. This course is designed to provide the students with a thorough understanding of the welfare economic theories and their applications in environmental economic policy analysis. Upon completion of the course, the students are expected to gain solid understanding of both theoretical and applied welfare economics and able to use the acquired knowledge in analyzing environmental policy phenomenon more efficiently.

Course Contents:

*Basic Concepts in Welfare Economics***:** Nature of welfare economics; approaches of welfare economics: the early Neo-classical Welfare Economics and the New Welfare Economics; welfare criteria: the Paretian criterion, the compensation criterion, the social welfare function, the Bergson criterion and Arrow's Impossibility Theorem.

Measurement of Welfare: Measuring social welfare: cardinal utility, ordinal utility and the social choice theory; welfare measurement for the producer, welfare measurement for the consumer, welfare measurement for factor owners and measurement of aggregate market welfare.

Welfare Maximization: Maximization of social welfare: from production function to the production possibility curve, from production possibility curve to the grand utility possibility curve, from the grand utility possibility curve to the point of constrained bliss; Pareto optimality and market failure: conditions of Pareto optimality, Non-attainment (market failure) of Pareto optimality: cases of imperfect markets, externalities, public goods, common property right, asymmetric information and incomplete market; Measures to correct the problem of market failure.

Social Choice Theory: Revisiting Arrow's (Im)Possibility Theorem, Gibbard-Satterthwaite Theorem, Sen's Liberal Paradox, Voting Rules and Interpersonal Comparisons of Utility.

Suggested References:

■ Just, Richard E.; Hueth, Darrell L. and Schmitz, Andrew, "The Welfare Economics of Public Policy- A Practical Approach to Project and Policy Evaluation", Edward Elgar Publishing Limited, 2004

■ Broadway, Robin W and Bruce, Neil, "Welfare Economics", Wiley-Blackwell; 1 Edition, 1991

■ Jhingan, M.L., "Micro Economic Theory", Vrinda Publications (P) Ltd, 7th Edition, 2012

■ Henderson, James M. and Quandt, Richard E., "Microeconomic Theory- A Mathematical Approach", Tata McGraw-Hill Edition, 2003

■ Varian, Hall R. "Microeconomic Analysis", W. W. Norton & Com, Third Edition, 1992

■ Mas-Colell, Andreu; Whinston, Michael D. and Green, Jerry R, "Microeconomic Theory", Oxford University Press, First Indian Edition, 2006

■ Kaushik Basu, "Beyond the Invisible Hand: Groundwork for a New Economics" Princeton University Press, 2010.

C-202: Statistical Methods and Econometrics

Introduction:

This course includes both statistical tools and techniques, and econometric methods that are usable in environmental economics. The course is specially designed to make the students conversant in studying quantitative environmental economics and its applications to analyze diverse phenomena linking economy and the environment with the use of advanced statistical techniques.

Course Contents:

Essential Statistics: Summarizing numerical information (measures of central tendency, measures of dispersion, graphical methods), theory of probability and probability distributions.

Inferential Statistics: Estimation procedures (point and interval estimation), properties of a good point estimator; test of hypothesis (central limit theorem, t-test, z-test, χ^2- test, F-test, non-parametric test procedures).

Econometrics: Covariance & correlation; Linear regression: Simple regression, Multiple regression, Residual analysis, Violation of assumptions and their remedial measures; Qualitative Response Regression Model: The linear probability model, the Logit model, the Probit model, the Tobit model; Time series econometrics: basic concepts & forecasting.

Suggested References:

■ Newbold, P., Carlson, W., Thorne, B., "Statistics for Business and Economics", 8th Edition, 2009

■ Gujarati, D.N., "Basic Econometrics", 4th Edition, 2003

■ Montgomery, D.C., Peck, E.A., Vining, G.G., "Introduction to Linear Regression Analysis", 5th Edition, 2012

■ Roy M.K., "Fundamentals of Probability & Probability Distributions", 3rd Edition, 2008

■ A.M. Mood, F.A. Graybill, D.C. Boes, "Introduction to the Theory of Statistics", 3rd Edition, 1974

■ Bernett, V., "Comparative Statistical Inference" 3rd Edition, 1973

■ Bhattacharyya, G.K., Jhonson, R.A., "Statistical Concepts and Methods", 1st Edition, 1977

■ Daniel, Wayne W., Cross, C.L., "Biostatistics- A Foundation for Analysis in the Health Sciences", 10th Edition, 2013

■ Hosmer, D.W., Lameshow, S., "Applied Logistic Regression", 2nd Edition, 2000

■Makridakis, S., Wheelwright, S.C., Hyndman, R.J., "Forecasting-Methods and Application", 3rd Edition, 2000

C-203: Environmental Economics—Theory and Practices

Introduction:

This course includes both elementary concepts of environmental economics and its advanced theories and applications. It is specially designed for those who have the basic understanding on economics science, but are not well-versed with environmental (economics) theories which can be applied for internalizing environmental challenges into the development policy planning and processes.

Course Contents:

Economy-Environment Linkages: Economic development and the environment; the notion of carrying capacity of the environment; linkage between economy and the environment.

Market Failure, Public Goods and Externalities: Social efficiency and markets; market failure and the theory of the second best: public bads and externalities; property rights; addressing pollution problems: Pigovian tax and Coase Theorem.

Open Access and Common Property Resources: Concepts and nature of common property resources (CPRs) and open access natural resources; open access resource and free riding problem; institutional failure and degradation of CPRs; the Tragedy of the Commons; economics of the conservation of CPRs and the role of state.

Suggested References:

■ Bhattacharya, R.N., "Environmental Economics", Oxford University Press, 2001

■ Dasgupta, Partha and Maler, Karl-Goran, "Environmental and Resource Economics: Some Recent Development", SANDEE, 2004

■ Hanley, N; Shogren, J.F. and White, B., "Environmental Economics in Theory and Practice, McMillan, 1997

■ Kolstad, Charles D, "Environmental Economics", Oxford University Press, 2010

■ Nick Hanley, Jason F. Shogren and Ben White, "Introduction to Environmental Economics", 2001

■ Sankar, U., "Environmental Economics", Oxford University Press, 2001

■ Tietenberg, Tom, "Environmental and Natural Resource Economics", 8th Edition, 2008.

2.9.3 Third Semester

The aim of the third semester of the Master of Economics (Environmental Economics) is to acquaint the students with the economics of environmental policy making and regulations. This includes two courses on economics of environmental regulation and environmental decision making, while the third course on the economics of sustainable development is included to enable the students to understand the need for sustainable development in the present context. Upon completion of these courses, students are expected to learn about the available policy options for environmental decision making and be able to use their acquired knowledge to promote environment friendly growth and development.

C-301: Economics of Environmental Regulation

Introduction:

This course is designed to make the students to learn about possible impacts of environmental pollutions on economic activities, available instruments for pollution control and needs for environmental regulation for abatement of pollutions with efficacy.

Course Contents:

Environmental Analysis: Framework Analysis: impact analysis (environmental impact analysis, economic impact analysis and regulatory impact analysis), cost-effectiveness analysis, damage assessment and risk analysis; Cost-Benefit Analysis: the damage function, measuring damage costs (various methods) and problems in benefit estimation.

Environmental Policy Analysis: Criteria for Evaluating Policy Analysis: efficiency, cost effectiveness, fairness, incentives for technology, improvements, enforceability, materials balance issues, moral considerations and government failure; *c*ommand and control measures—types of standards, the economics of standards, standards and incentives, the economics of enforcement; Incentive-based Strategies: emission charges and subsidies-emission chares and abatement subsidies; Transferable Discharge Permits: general principles and cases of CO_2 emission in the present context.

Theories of Environmental Regulation: Information, enforcement and technology issues; the Porter Hypothesis; Case Studies: selected success stories and failure in implementing environmental regulation of Bangladesh, South Asia and other countries.

Suggested References:

■ BC Field and MK Field, *"*Environmental Economics: An Introduction*"*, McGraw-Hill, 2012

■ Bhattacharya, R.N. "Environmental Economics", Oxford University Press, 2001

■ Hanley, N; Shogren, J.F. and White, B. "Environmental Economics in Theory and Practice, McMillan, 1997

■ Murty, M.N. "Environmental Regulation and Economics of Environmental Policies", Oxford University Press, New Delhi, 2004

■N. Hanley, Jason F. Shogren and Ben White, "Introduction to Environmental Economics", Oxford University Press, 2001

■ Sankar, U. "Environmental Economics", Oxford University Press, New Delhi, 2001

C-302: Environmental Decision Making

Introduction:

Environmental decisions are often constrained by lack of information and asymmetric understanding in relation to an informed policy/ decision can be made of. This course is particularly designed to educate the learners on the various available tools and techniques of environmental valuation and information generation for decision making. Such information can play a very critical role in effective policy making in a world of increasing environmental challenges.

Course Contents:

Concept of Environmental Valuation: Decision making under uncertainty and the role of environmental valuation; defining the value of a change in environmental quality; environmental values and the concept of shadow prices; concept of total economic value (TEV); need for environmental cost-benefit analysis (CBA).

Non-market Environmental Valuation Using Stated Preference Methods: Measuring the welfare effects of environmental changes; major theories of environmental decision

making and valuation of nature; valuation techniques: contingent valuation, contingent ranking and choice experiment methods.

Non-market Environmental Valuation Using Revealed Preference Methods: Revealed preference methods: travel cost, hedonic pricing and benefit transfer methods; recent debates on environmental valuation and concept of discounting.

Suggested References:

■ Gunatilake, Herath M. "Environmental Valuation: Theory and Applications", University of Peradeniya, Sri Lanka, 2003

■ Freeman, A M, "The Measurement of Environmental and Resource Values, Resource for the Future", Washington DC, 1993

■ Bhattacharya, R.N. "Environmental Economics", Oxford University Press, 2001

■ Hanley, N; Shogren, J.F. and White, B. "Environmental Economics in Theory and Practice, McMillan, 1997

■ Nick Hanley, Jason F. Shogren and Ben White, "Introduction to Environmental Economics", Oxford University Press, New Delhi, 2001

■ Tietenberg, Tom, "Environmental and Natural Resource Economics", 8th Edition, 2008

■ Sankar, U "Environmental Economics: Readers in Economics", Oxford University Press, 2001

C-303: Economics of Sustainable Development

Introduction:

This course is designed to deal with the concept of sustainable development, the indicators of sustainable development and why it is important in the context of economic planning and decision making. Upon completion of this course, the students are expected to gain theoretical and practical understanding on the economics of sustainable development and should be able to use the acquired knowledge in practice.

Course Contents*:*

Introduction to Sustainable Development: Concept of growth, development and environment; environmental degradation and poverty; concept and principles of

sustainable development; concept of green economy, eco-economy and low carbon economy; evolution of sustainability; strategies for promoting sustainable development.

Measuring Economic Success and Need for Sustainable Development: Traditional tools of measuring economic performance (GDP); problems with traditional measures; concept of green/environmental accounting and theory of limits to growth.

Indicators of Sustainable Development: Indicators of sustainable development, problems of achieving sustainable development, the Millennium Development Goals (MDGs); evaluation of the *Agenda 21* and the Rio+20.

Suggested References**:**

■ Bhattacharya, R.N. "Environmental Economics", Oxford University Press, 2001

■ Daly, Herman E, "Beyond Growth: The Economics of Sustainable Development", Beacon Press, 1997

■ Joshi, M.V. "Theories and Approaches of Environmental Economics", Atlantic Publishers and Distributors, New Delhi, 2001.

■ N. Hanley, Jason F. Shogren and Ben White, "Introduction to Environmental Economics", Oxford University Press, New Delhi, 2001

■ Sankar, U. "Environmental Economics", Oxford University Press, New Delhi, 2001

■ Sengupta, R.P. "Ecology and Economics: An Approach to Sustainable Development", Oxford University Press, New Delhi, 2001

■ Alan Gilpin, "Environmental Economics: A Critical Overview", John Wiley & Sons, Ltd. Singapore, 2000

2.9.4 Fourth Semester

Two primary objectives are kept in mind while designing the last & final semester of the Masters programme in Environmental Economics: (a) to train the students in social science research methodologies, and particularly methods used in environmental economics (using modern tools and techniques); and (b) to acquaint the students with practical research works. In addition to these objectives, this semester also offers the students an opportunity to learn a few optional courses, including economics of climate change, project planning and evaluation, trade and environment and public finance. These courses resume high importance and are of great use in the present context.

It is expected that many of the environmental economics graduates would intend to join advanced research studies/courses after completion of this programme and a theoretical understanding of research methods with a strong and practical exposure will enable them to enter into the world of economic research properly equipped. Furthermore, those who would join teaching or research-oriented professions will find this training equally useful. Increasing demand for trained man-power in the field of multi-dimensional environmental research by international bodies, development sectors, research organizations, government sector may also find the Masters in Environmental Economics graduates ready-recruit.

This semester will cover a paper on research methodology along with computer applications in environmental economics and writing a dissertation. The details are given below:

C-401: Research Methodology & Computer Applications in Environmental Economics

Introduction:

The goal of the research methodology course is to communicate the research process by using a very practitioner-oriented technique which will include teaching theoretical understanding of various research tools and techniques. Use of modern statistical softwares like SPSS and Eviews will also be taught to train them in data management and data analysis. The course will carry 60% weightage on the first part of the syllabus (i.e.

research methodology) and the remaining 40% for the computer applications in environmental economics.

Course Contents:

(a) ***Research Methodology***

Research Process- A Quick Glance: Formulating research problem, constructing instruments for data collection, selecting sample, writing a research proposal, collecting data, processing and displaying data and writing research report.

Identification of Variables: Converting concepts into variables; types of variables from the viewpoint of (i) causal measurement (ii) study design; and (iii) unit of measurement.

Construction of Hypothesis: Definition of hypothesis; function of hypothesis; testing of hypothesis; errors in testing hypothesis and hypothesis in quantitative research.

Research Design: Study design based on number of contacts; study design based on the nature of investigation; cross-over comparative experimental design; replicated cross-sectoral design; trend studies cohort studies; panel studies and so on.

Study Design in Qualitative Research: Case study, oral history, focus group discussion, participant observation, holistic research, community discussion forum, action research.

Methods for Data Collection: Difference in methods of data collection in quantitative and qualitative research; major approaches to information gathering, collecting data using primary sources such as observation, the interview, questionnaire, pre-testing a research instrument, using data from secondary sources.

Selecting Sample: Sampling in quantitative research–concepts of sampling, principles of sampling, types of sampling, systematic sampling design, the calculation of sample size.

Data Collection Using Attitudinal Scale: Measurement of attitudinal scale in quantitative and qualitative research; Types of attitudinal scales such as Likert scale, Thurstone scale, and Guttman scale.

Validity and Reliability in Research: The concept of validity and types of validity in quantitative research.

Data Collection & Ethical Issues: Concepts of ethics; research and ethical issues.
Research Methodology and Practical Evaluation: Evaluation of programmme monitoring and planning – from different perspectives.

(b) ***Computer Applications for Environmental Economics***: Among various tools and techniques which will be taught in the class may include use of SPSS and STATA, besides other relevant statistical software commonly used for environmental economics research. Students will also be encouraged to use the acquired knowledge in writing their dissertations.

Suggested References:

■ Kothari, C.R. "Research Methodology", New Delhi, India, 2008
■ Kumar, R. "Research Methodology- A Step by Step Guide for Beginners", Sage, New Delhi, 1996
■ May, T. "Social Research: Issues, Methods and Process", Buckingham: Open University Press, 2001
■ Babbie, E. "The Practice of Social Research", Thomson Wadsworth, 2007
■ Manuals on Excel, SPSS and STATA, latest versions

C-402: Introduction to Resource, Ecological and Energy Economics

Introduction:

Keeping in mind the increasing importance of resource, ecological and energy economics and the need for understanding the sticking differences and similarities between environmental economics with these disciplines, this course is specially designed to educate the students on the fundamentals of these disciplines with the major theories and methods which is expected to make the learners theoretically very sound and practically capable of solving complex economic phenomenon in the real world situations.

Course Contents:

Economics of Natural Resources: Concept of natural resources and their types; role of natural resources in economics: natural resource intensity and economic growth;

economics of exhaustible resources: Hotelling's Rule of non renewable resource extraction, the case of backstop; economics of renewable resources: fisheries and forests.

Ecological Economics: Ecological principles vs. economic principles; problems and principles of ecological economics: sustainable scale, fair distribution, and efficient allocation; ecosystems, biodiversity and ecological services; substitutability vs. complementarity of natural, human, and manufactured capital; population and carrying capacity; measuring well-being; role of policies, institutions and instruments.

Energy Economics: Introduction to energy fundamentals (types of energy resources, energy vs. power, merits and demerits of different energy resources); externalities of conventional energy resources; energy demand and nature of energy market in the global context, political economy of energy resources.

Suggested References:

■ BC Field and MK Field, *"*Environmental Economics: An Introduction*"*, McGraw-Hill, 5th Edition, 2009

■ Bhattacharya, R.N. "Environmental Economics", Oxford University Press, 2001

■ Bhattacharya, Subhes C. "Energy Economics: Concepts, Issues, Markets and Governance", University of Dundee, UK, 2011

■ Conrad, J.M. and Clark, C.W. "Natural Resource Economics", Cambridge University Press, 1987

■ Daly, H. E., and J. Farley, "Ecological Economics: Principles and Applications", Island Press, Washington, DC. 2003

■ Hanley, N; Shogren, J.F. and White, B. "Environmental Economics in Theory and Practice, McMillan, 1997

■N. Hanley, Jason F. Shogren and Ben White, "Introduction to Environmental Economics", Oxford University Press, 2001

■ Sengupta, R.P. "Ecology and Economics: An Approach to Sustainable Development", Oxford University Press, New Delhi, 2001

■ Tietenberg, Tom, "Environmental and Natural Resource Economics", 8th Edition, 2008

■ Robert Costanza, John H. Cumberland, Herman Daly, Robert Goodland, Richard B. Norgaard, "An Introduction to Ecological Economics", St. Lucie Press and International Society for Ecological Economics, 1997
■ Banks, Ferdinand E. "Energy Economics: A Modern Introduction", Springer, 2000

C-403: Dissertation

Introduction:

The basic purpose of introducing a dissertation for the students of Environmental Economics is to give selected students an opportunity to conduct research work on any area of their choice (with mutual understanding with the designated supervisor), possibly on any aspect of environmental economics using the knowledge and skills they have acquired throughout the programme. It is expected that at least three major objectives will be achieved from writing dissertations by the Environmental Economics graduates: (i) to be acquainted with research problem formulation; (ii) learn the techniques of data management and data processing; and (iii) know how to write a research report using the findings.

In economics and particularly in the area of environmental economics, a postgraduate level programme without enough training on the tools and techniques of research—both theoretical and practical- remains incomplete. It is thus expected that upon completion of a dissertation the students will be able to understand basic research, formulate research questions, and be familiar with the methods of collection of data and data management tools and how to analyze data for writing a dissertation. Moreover, problems with environmental economics and particularly in the area of climate change, although major changes are occurring in many ways but there also remain many uncertainties. Thus one needs to be equipped with good skills for conducting empirical research to be able to fulfill the need of the time. The Master of Economics (Environmental Economics) programme follows this principle.

Guidelines for Writing the Dissertation: The steps to write dissertation by selected students of Environmental Economics programme will be based on following guidelines:

Choice of the Research Topic: Topics can be chosen on any aspect of environmental and development economics where the students will be able to utilize their acquired knowledge and techniques throughout this programme. This should be an empirical work and the use of both primary and secondary data are strongly encouraged. In the selection of the research topic students will be required to discuss with their (assigned) respective supervisors. It is strongly recommended that environmental challenges common to Bangladesh and other developing countries which have strong economic linkages be given highest priority in research for writing the dissertation.

Development of the Synopsis: Once the research topic is selected (on the basis of consultation with the respective supervisor), a student will be required to design a research proposal/synopsis on the proposed work *within a month* of the start of the final semester. Upon completion of the synopsis they will have to give formal presentations of their research proposals for faculty approval. The faculty members along with academic and governing council members are expected to be present in the synopsis presentations and provide useful guidelines. Following the suggestions made on their presentations the students will have to finalize their synopsis within *fifteen days* of research presentations and submit the same to assigned supervisors.

Duration of the Research & Dissertation Writing: Once the synopsis is finally approved, the students will be required to start their research works formally. The supervisors will have regular meetings with the students and provide scholarly guidance. The students will have to complete their research works and finish writing dissertations within *four months* from the final approval of their synopsis. Once the research is over, they have to give final presentation before an expert panel. The students will be given *ten days* to incorporate the suggestions made by the expert panel and submit the final dissertation for evaluation.

Instructions for Submission: The length of the dissertation will ideally be no more than 15,000 words. The medium of writing will be English. Standard formats of dissertation writing will be followed. The students will have to submit three copies of the dissertation in bounded versions (paperback) along with a soft copy of the same within the stipulated time period.

Evaluation of Dissertation: The submitted dissertations will be sent to external experts for final evaluation. It is to be mentioned here that experts from outside of the University of Dhaka are also allowed to evaluate the dissertations, particularly considering the environmental economics discipline is an emerging one and not many experts are currently available in DU. Of 200 marks (8 credit hours), 100 marks (4 credit hours) will be internal and remaining 100 marks (another 4 credit hours) will be based on the external evaluation of the dissertation by an external expert. The internal 100 marks (4 credit hours) will be awarded based on a student's performance on: designing of the research synopsis and presentation (40 percent), supervisor's report to the programme coordinator about the student's overall performance throughout the dissertation work period (20 percent) and presentation of the final outcomes before the faculty members and experts (40 percent).

Others: It is highly recommended that students use the research findings for scholarly publications in journals or edited volumes. A copy of their dissertation will be stored in the School Library for future reference.

Suggested References:

■ Allan and Skinner (ed.) "Handbook for Research Students in the Social Sciences", 1993

■ Turabian, K.L. "A Manual for Writers of Term Papers, Thesis and Dissertations", Chicago University Press, 1996

■ Saha, Dr. Subrota Kumar, "Research Planning & Proposal Writing Skill", A H Development Publishing House, Dhaka, 2010

■ Collis, Jill and Hussey, Roger, "Business Research- A Practical Guide for Undergraduate and Postgraduate Students", Palgrave Macmillan, London, 2009

■ Moser, Claus Adolf; Kalton, Graham and Moser, Sir Claus, "Survey Methods in Social Investigation", Ashgate Publishing; 2nd Edition, 1985

C-404: Economics of Climate Change

Introduction:

Evolving climate change is a major threat to the global security and even for the Planet Earth. Naturally this is now a subject being widely discussed and debated around the

globe. Bangladesh is at the forefront of climate change impacts. Understanding of climate change implications, possible measures to minimize its impacts and to cope up with changes, therefore, need to be given due importance in post-graduate level studies in environmental economics. Keeping that very objective in mind this course is designed to make the students understand the economics of climate change and what is happening around the world and in Bangladesh in relation to both of its impacts and approaches to combat it. Upon completing this course, students are expected to understand the basic science of climate change, its impacts on our economic activities and the available methods of climate change adaptation and mitigation which can be used to minimize the negative consequences. It should also enable them to understand the political economy of climate change which is expected to help them in effective decision making in their professional lives.

Course Contents:

Introduction to Climate Change: The science of global warming; global warming and climate change- concepts, indicators and historical responsibilities; vulnerability to climate change; economic and social impacts of climate change; implications of climate change (on the world economy and Bangladesh).

Political Economy of Climate Change: Historical perspective of climate change; neoliberalism and the concurrent world economic order; political economy of international climate regime (the UNFCCC process); climate negotiations- Agenda 21, Kyoto Protocol and major COP processes; the developing and the most vulnerable economies; emerging issues of climate change- carbon trading, REDD, REDD+; climate justice and Southern perspectives.

Economics of Climate Change: Climate change and development challenges; climate change as a market failure; GHG emissions as externalities; impacts of climate change over time and space; uncertainty and irreversibility; economics of climate change adaptation and mitigation (agriculture, energy use); frameworks for costing the impacts of climate change: general equilibrium analysis (CGE/Input-Output Modeling, etc.) and partial equilibrium analysis (CVM, etc.)

Suggested References:

■ Stern, N., "Review on Economics of Climate Change: The Stern Review", Cambridge University Press, 2007

■ ADB, "Economics of Climate Change in Southeast Asia: A Regional Review" 2009

■ BC Field and MK Field, *"*Environmental Economics: An Introduction*"*, McGraw-Hill, 2012

■ OECD, "The Economics of Climate Change Mitigation: Policies and Options for Global Actions beyond 2012", Organization for Economic Cooperation and Development, Paris, 2009

C-405: Trade and Environment

Introduction:

A world without international trade today simply cannot be imagined. It is perhaps trade that makes the world closer and more integrated. Gains from international trade are conspicuous, although distributional issue continues to remain a challenge. Besides, trade also has another dimension which needs to be dealt with care, the environmental consequences of trade, particularly in the age of climate change and massive environmental degradation across the developing world. Also, the question of linkages between trade and environment, environmental requirements and market access, trade in environmental/green technologies, environmental impacts of subsidies, etc. also demands meticulous attention. This course is designed to help students of environmental economics appreciate such complex issues and enrich their analytical skills for assessing the impacts of trade on environment and the role of technologies.

Course Contents:

Theories of International Trade: Gains from trade and patterns of trade; Trade Theories: Ricardian model, Heckscher-Ohlin model and the standard trade model; imperfect competition and increasing returns; the pollution heaven theory.

WTO, Trade and Environment: Origins, principles and national environmental management; WTO and international trade; environmental requirements and market access: eco-labels, EMS certification and international trade, environmental management

system certification; green economy and WTO; environmental provisions in RTAs, MEAs and WTO.

Trade, Environment and Technologies: Trade opening in environmental technologies; environmental techniques and intellectual property rights; environmental goods and services negotiations; environment related support measures; environmentally harmful subsidies: cases of fossil fuels and fisheries.

Suggested References:

■ Krugman, Paul; Obstfeld, Maurice and Melitz, Marc, "International Economics: Theory and Policy", Prentice Hall; 9 Edition, 2011

■ Krugman, Paul, "Rethinking International Trade", Cambridge: MIT Press, 1990

■ Copeland, B and Taylor, M S, "Trade and the Environment: Theory and Evidence", Princeton University Press, 2003

■ Najam, Adil; Halle, Mark and Melendez-Ortiz, Ricardo (Eds), "Trade and Environment: A Resource Book", IISD, ICTSD and the Ring, 2007

■ "Environment and Trade: A Handbook", IISD and UNEP, 2000

■ Werner Antweiler, Brian R. R. Copeland & M. Scott Taylor, "Is free trade good for the environment?" American Economic Review, Vol. 91(4), pp. 877-908, September, 2001

■ Copeland, Brian R and Taylor, M Scott, "North-South Trade and the Environment", the Quarterly Journal of Economics, MIT Press, Vol. 109(3), pp. 755-787, August 1994.

C-406: Project Planning and Evaluation

Introduction:

A degree in economics without some knowledge of planning and evaluation would be deficient, particularly for those students who aspire to work closely with development sector. With a realization of this necessity, this course is designed to acquaint the students with the concept and understanding of development projects; acquire knowledge and skills necessary to propose, plan, implement and evaluate development projects; and enhanced skills and knowledge for overall project management. It is believed that upon completion of this course, students will be able to develop and broaden their

understanding on various tools and analytical techniques for project planning, appraisal and evaluation.

Course Contents:

Concept of Development Project: Introduction to development projects: concept, rationale, categories, features and characteristics; project life cycles; the four P's: people, planning, policies and project; role of development projects in economic development.

Project Planning, Design, Monitoring and Evaluation: Project planning and designing process; steps in project planning and designing; tools of project monitoring and evaluation.

Selected Tools of Project Analysis, Design and Management: Social/economic/ environmental impact assessment, stakeholder analysis, logical framework and SWOT analysis; role of cost- benefit analysis.

Suggested References:

■ Chowdhury, S. "Project Management", Tata McGraw Hill Publishing Co., New Delhi, India, 1993

■ Curry, S and Weiss, J. "Project Analysis in Developing Countries", McMillan Press Limited, London, 2000

■ Gosling, L and Edwards M. "Toolkits: A Practical Guide to Assessment, Monitoring, Review and Evaluation", Save the Children, London, 1995

■ Ad van der Weide, "Project Planning and Management", Purdue University Press, 2004

■ Lester, Albert, "Project Management, Planning and Control", Butterworth-Heinemann, 2006

■ Santos, Jose Maria Delos, "Project Management: A Systems Approach to Planning, Scheduling and Controlling", Wiley, John & Sons; 2013

■ John Glasson, Riki Therivel, Andrew Chadwick, "Introduction to Environmental Impact Assessment", Taylor and Francis, 2012

Part-III: OTHER ANTICIPATED ACADEMIC PROGRAMMES

3.1 MPhil & PhD Programmes

Demand for highly trained economists in a growing economy like Bangladesh is increasing day by day. Due to many emerging challenges pertaining to economic activities, particularly in the perspective of socio-economic and environmental issues, multi-disciplinary treatments linking economic, environmental and socio-cultural approaches are gaining increasing importance. This demands more economists from a multi-disciplinary background who can effectively face such challenges for the economy. Similarly, many budding economists of the country due to lack of opportunities (e.g. finance, family engagement, etc.) may also find the research degree programmes (MPhil and PhD) of Dhaka School of Economics highly suitable.

Dhaka School of Economics intends to give special focus on contemporary economic issues and emerging challenges in its research programmes which would pave the way for achieving some paradigm changes in our traditional development thinking in economic and development policy making. The school is indomitable to make it a 'centre of excellence' in research and teaching.

Besides its highly experienced and dedicated faculty members, the members of its academic council will also oversee the overall progress of the programmes. Understandings with renowned universities from home and abroad will also be explored and research scholars will be encouraged to participate in international conferences, seminars, workshops and short-training programmes and produce journal articles for refereed journals.

3.2 Master's Programmes

Dhaka School of Economics will leave no stone unturned to make it a 'Centre of Excellence' in higher education in economics in the line of LSE or Delhi School of Economics (DSE). Apart from the currently offered five post graduate programmes, the

school is also trying to get a positive node from the University of Dhaka for opening more Master's-level programmes in economics.

3.3 Diploma/Certificate/Training Programmes

Dhaka School of Economics (DScE) also intends to offer certain specialized certificate and diploma programmes in the area of environmental economics, applied econometrics, computer applications in economics, economics of climate change and many other related fields given approval from the University of Dhaka. Such programmes will be designed keeping in mind especially the demand for many professionals who need to be up-to-date on emerging issues and the need of those who are engaged in economic research, teaching or other areas of applied economics to improve their capabilities.

PART-IV: PUBLICATION

4.1 Books/Research Reports/Seminar Proceedings

Dhaka School of Economics aspires to publish quality research reports, books and seminar proceedings besides publishing its own journal and quarterly campus magazine on a regular basis to promote research, publication and dissemination in the area of economics and allied subjects. It has already published a number of special reports based on the papers presented on various economic issues of importance in a national workshop organized by Dhaka School of Economics in association with Bangladesh Economic Association (BEA) and Palli Karma-Sahayak Foundation (PKSF) in April 2011, titled: "Bangladesh—A Country of Middle Standard of Living by 2021: Pathways, Potentials and Challenges". Besides these, a few Working Papers have already been published and it intends to publish selected articles as seminar proceeding in an edited volume soon. In addition to these, it will also publish research reports based on the on-going research projects in due course of time.

It is also expected that DScE will regularly publish works mainly produced by the faculty members, people associated with DScE or other renowned economists, not only to produce its own research works in published forms but also to encourage scientific and quality research in economics as well as multi-disciplinary approaches in the perspective of changing economic environment. In this regard, the school also wants to set up its own publication brand titled "Dhaka School of Economics Press Limited".

4.2 Quarterly Campus Magazine

The School publishes its 'Quarterly Newsletter', mainly to encourage students and scholars to get familiar with and excel in writing in economics. Under the guidance of experienced faculty members and an advisory board, the magazine publishes short essays, research reports, news and views on economic, environmental, development and other multi-disciplinary issues of interests. The magazine also publishes news and updates on students' research activities, works presented in seminars and workshops and on cultural activities of the school. Students are strongly encouraged to contribute to the magazine on a regular basis.