Natural Resources and Environmental Economic – 3 credits
(Selective course)

Fall semester, 2020-2021

Cooordinator	**Nguyen Thi Van Ha**
Credits	3 ECTS (selective course), 33.75 in-class hours
Lecturers	Nguyen Thi Van Ha (HCMUNRE, Vietnam) Nguyen Lu Phuong (HCMUNRE, Vietnam) Nguyen Thi Quynh Trang (HCMUNRE, Vietnam) Su Thi Oanh Hoa (HCMUNRE, Vietnam)
Level	MSc and PhD courses
Host institution	Faculty of Environment, HCMUNRE, Vietnam
Course duration	15 weeks (Fall 2020 -2021; Fall 2021 -2022)

Summary
This 3 ECTS course introduces knowledge about economics applied into environmental and natural resources management based on sustainable development orientation. The course enhances the importance of environment to economic development and the influences of economic development on environment. Students are able to: explain the reasons of environmental pollution and degradation; implement the economic tools for environmental protection activities.

The course provides methods for estimating and calculating values of natural resources and environment, value estimation of ecosystem, analyzing cost and benefits using current value analysis, utilizing current policy and economic incentives to keep a balance between quality and quantity of environmental resources. The course enables student to provide proposals for sustainable economic development.

Target student audiences
Master or PhD students majoring in environmental sciences, environmental engineering, environmental management, natural resources management and planning, natural resource economy, policies and governance, etc.

Prerequisites
Required courses (or equivalents):
- Environmental law and policies,
- Environmental Management,
- Environmental Impact Assessment and social impact assessment.

Aims and objectives

Introduce knowledge about economics, environmental resources and current waste problems in Vietnam as well as around the globe under an environmental management view.

Introduce evaluation methods, the value of environmental resources, evaluation of the environment - ecosystem, cost analysis and benefits evaluation using current value analysis, utilization of current policy and economic incentives to keep a balance between quality and quantity of environmental resources.

Course goals ***(CGs)***	***Course goal description***
CG1	Understand basic knowledge of economic and implement them to solve enviornmental issus and economic issues**.**
CG2	Proficiently apply natural resource valuation methods, cost and benefit analysis (CBA) methods to compare and select solutions.
CG3	Appropriate use of economic tools to manage the environment and natural resources for specific target situations.
CG4	Develop analysis skills, logical thinking, analytical and problem-solving skills that meet the needs of independent and group work.

General learning outcomes:

By the end of the course, successful students will achieve the following course expected learning outcomes (CELO):

CELO	**CELO Description**
Knowledge and Understanding:	
CELO1	Gain the basic micro and macro-economic knowledge such as: demand and supplies; principles of BPP, PPP, VPP and co-relationship between economic and environment, society and sustainability development.

CELO2	Implement smoothly methods of CBA, value- evaluation for natural resources, pollution quota, natural resources taxes and environmental protection fee.
CELO3	Implement market based solutions such as: taxes, environmental protection fee, pollution quota, transferrable environmental quota, Deposit vs. refund, compensation costs for natural resources and environmental management.
CELO4	Understand and implement the Vietnamese legal framework and regulations; withdraw the practical experiences of economic tools use in countries around the World.
Skills outcome	
CELO5	Look up, collect information and documents and synthesize statistical data on economic, natural resources and environment; agrue, review and defend economic tools utilization.
CELO6	Develop critical thinking skills during group work; Propose the economic solutions for environmental protection activities and natural resources management; decision making.

Overview of sessions and teaching methods

The course will make most of interactive and self-reflective methods of teaching and learning and, where possible, avoid standing lectures and presentations.

Learning methods

- Video presentations
- Interviews, surveys, fieldtrip, group work, written articles/essay
- Project Based Learning
- Literature review
- Role playing
- Case studies such as: Stakeholder analysis/client consultancy

Overview of learning sessions

Chapter	Description	Credit hours	Lectures	Practice and Discussion
Chapter 1	Course description	1	1	0

	Introduction on environmental and natural resources economics	2	2	
Chapter 2	Micro Economic (supply-demand relationships)	6	4	2
Chapter 3	Pollution Economic	9	6	3
Chapter 4	Economic tools and Incentives	8	5	3
	Mid-term exams	1		1
Chapter 5	Cost & Benefit Analysis	3	2	1
Chapter 6	Natural Resources Economic	6	4	2
Chapter 7	Evaluation methods of natural resources	9	6	3
	Total	**45**	**30**	**15**

Course workload

The table below summarizes course workload distribution:

Activities	**Learning outcomes**	**Assessment**	**Estimated workload (hours)**
In-class activities (33.75 hours)			
Lectures	Understanding theories, concepts, methodology and tools	Class participation	10
Moderated in-class discussions	Understanding various policy and management contexts and common problems in communication in environmental and natural resources economics	Class participation and preparedness for discussions	10
In-class assignments, field assignment	Understanding various policy and management contexts and common problems in communication in environmental and natural resources economics	Class participation and preparedness for assignments	10

Reading and discussion of assigned papers for seminars and preparation for lectures	Familiarity with and ability to critically and creatively discuss key concepts, tools and methods as presented in the literature	Class participation, creative and active contribution to discussion	2.5
Group presentation	Ability to interpret data, to analyze audience, and to use the concepts, tools, and methods for communicating and defending the ideas presented in report	Quality of group assignments and individual presentations	5
Independent work (75 hours)			
Group work: - Contribution to the group case-study projects - Contribution to the preparation and delivery of individual presentation - Contribution to the web-application	Ability to interpret data, to analyze audience, and to use the concepts, tools, and methods for communicating information to all participants Select one study case of evaluation natural resource values and withdraw the learnt lessons which could be transferred to Viet Nam	Quality of group assignments and individual presentations Quality of essay	30
Course group assignment	Ability to conceptualize and frame an environmental governance problem, find related literature and data, interpret data, use the concepts, tools and methods covered in the course, and draw policy/management relevant conclusions Select one preferred economic tools and write the essay to analyze how it can be applied to solve environmental and natural resources issues	Quality of developed essay	30
Group presentation	Ability to interpret data, to analyze audience, and to use the concepts, tools, and methods for	Quality of group assignments	15

	communicating and defending the ideas presented in report	and individual presentations	
Total			***113.75***

Grading

The students' performance will be based on the following:

Assessment

- Progress assessment (40%):
  - Quiz/Midterm examination (10%): students have to complete the quiz or Mid-term report.
  - Homework (20%): Essay on economic tool implementation.

- Final assessment (60%):

- Group report (30%): The students will be divided into groups of 4-5 students and choose one case study for analyse the success and failures of economic tool implementation for environmental and natural resources management and then withdraw the learnt lessons which could be transferred to Viet Nam or developing countries.
- Final examination (30%)

Evaluation

A (8.5 – 10)
B (7.0 – 8.4)
C (5.5 – 6.9)
D (4.0 – 5.4)

Course schedule

The overall schedule is provided below:

Week	Chapter	Topic	Lecturer
Week 1 - 2	1	- Guide to the course – purpose, objectives, learning outcomes, teaching and learning method, assignment and grading. **Chapter 1 – Introduction of Environmental and natural resources economics (ENRE)** 1.1. Main economic concepts 1.2. Concepts and definition on ENRE 1.3. Relationship between production and environmental resources 1.4. Environment and economic growth vs. sustainable development	Nguyen Thi Van Ha; Nguyen Lu Phuong

		1.5. Conflicts between economic development and environmental protection 1.6. Characteristics of economic models and associated limits	
Week 2	1	**Chapter 1 - Economy and environmental resources** 1.4. Analysis of environmental impacts under the view of economy 1.5. Stable and steady growth 1.6. Utilization of Environmental Engineering's practical applications in environmental management and protection in Vietnam	Nguyen Thi Van Ha; Nguyen Thi Quynh Tranh
Week 3 &4	2	**Chapter 2 – Micro Economic** 2.1. Micro Economic basic concepts 2.2. Market model, supply and demand market and their relationship; consumer surplus, producer surplus and social surplus External cost Market failure	Nguyen Thi Van Ha; Nguyen Thi Quynh Tranh
Week 5 -6	3	**Chapter 3 – Pollution Economic** 3.1. Economic issues that leads to degradation of environmental resources and pollution; Theory of pollution economic (BPP, PPP và VPP) 3.2. Optimal level of pollution 3.2. Coase principles – property own rights and their failure 3.3. Market solution for controlling optimal pollution 3.4. Government solutions vs. pollution management	Nguyen Thi Van Ha; Nguyen Thi Quynh Tranh
Week 7-9	4	**Chapter 4 – Economic tools and Incentives** 4.1. Environmental protection fee/tax 4.2. Natural resources taxes 4.3. Environmental pollution quota 4.4. Transferrable environmental pollution quota	Nguyen Thi Van Ha; Nguyen Lu Phuong

		- Midterm examination/Quiz 4.5. Deposite – refund tool 4.6. Environmental damage compensation 4.7. Circular economic 4.8. Waste economica 4.9. Assignment #1	
Week 10	5	**Chapter 5 – Cost & Benefit Analysis** 5.1. Cost & Benefit Analysis Concepts 5.2. Decision Principles of Society 5.3. Willingness to pay (WTP) and willingness to accept (WTA) 5.4. Calculation Methods of Cost and Benefit 5.5. Assignment #2	Nguyen Thi Van Ha; Su Thi Oanh Hoa
Week 11-12	6	**Chapter 6 – Natural Resources Economic** 6.1. Renewable resources 6.2. Non-renewable reosources 6.3. Characteristics of renewablle resources 6.4. Discount rate/ Net Present Value 6.5. Optimal harvesting time for natural resources exploitation 6.6. Assignments #3/seminar	Nguyen Thi Van Ha; Nguyen Lu Phuong
Week 13 -14	7	**Chapter 7 – Evaluation methods for Natural resources value** 7.1. Why we need to evaluate values of natural resources? 7.2. Introduction of natural resources evaluation methods 7.2.1 Total economic values of Natural resources 7.2.2 Evaluation of profit loss due to environmental pollution and degradation 7.3. Value evaluation methods 7.4.1 Evaluation methods for goods having market price	Nguyen Thi Van Ha; Su Thi Oanh Hoa

		7.4.2 Evaluation methods for goods without market price	
Week 15		**Group presentation**	Nguyen Thi Van Ha; Nguyen thi Quynh Trang

Course assignments

Course assignments will constitute a multi-part project:

- Assignment #1 (mostly in-class) – Calculate the environmental protection fee/ natural resources tax, environmental tax, benefit from transferred pollution quota, etc.
- Assignment #2 (mostly in-class) – Calculate cost benefit ratio, net present value, etc.
- Assignment #3 (mostly in-class) – Calculate the direct value and indirect value of forest, the most suitable time for harvesting fish, etc.

Literature

- Literature in English:

1. Carolina Machado and J. Paulo Davim (2020). Circular Economic for Engineering, Springer Nature Switzerland AG. ISSN 2365-0532 ISSN 2365-0540 (electronic), ISBN 978-3-030-43044-3 (eBook). https://doi.org/10.1007/978-3-030-43044-3.
2. Frank A. Ward (2012). Cost–benefit and water resources policy: a survey, Water Policy 14 (2012) 250–280.
3. Jack Payne, Paul McKeown and Matthew D. Jones (2020). A circular economy approach to plastic waste, Polymer Degradation and Stability, 165, 170-181.
4. M.A. Hannan, M.S. Hossain Lipu, Mahmuda Akhtar, R.A. Begum, Md Abdullah Al Mamun, Aini Hussain, M.S. Mia and Hassan Basri (2020). Solid waste collection optimization objectives, constraints, modeling approaches, and their challenges toward achieving sustainable development goals, Journal of Cleaner Production 277, 123557.
5. María-Laura Franco-García, Jorge Carlos Carpio-Aguilar and Hans Bressers (2019). Towards Zero Waste, Springer Nature Switzerland AG. ISSN 2543-0246 ISSN 2543-0254 (eBook), ISBN 978-3-319-92931-6 (eBook). https://doi.org/10.1007/978-3-319-92931-6.

6. Roy Brouwer and David Pearce (2005). Cost – Benefit Analysis and Water Resources Management. EdwardcElgar Publishing. Inc.
7. Scott J. Callan and *Janet M. Thomas (1996).* *Environmental Economics & Management: Theory, Policy, and Applications*, Thompson South-Western.
8. Tiffany M.W. Maka , Xinni Xionga , Daniel C.W. Tsanga, Iris K.M. Yua,b , Chi Sun Poona (2020). Sustainable food waste management towards circular bioeconomy: Policy review, limitations and opportunities Bioresource Technology, 297,122497.
9. UNECE (2007). Recommendations on Payments for Ecosystem Services in Integrated Water Resources Management. Second Preparatory Conference to the 15th OSCE Economic and Environmental Forum, Zaragoza, Spain, 12-13 March 2007, PC.DEL/175/07.

- Literature in Vietnamese:

1. R.Kerry Turner (1999). Kinh tế môi trường. Nhà xuất bản ĐH Nông Lâm TP.HCM.
2. Philippe Bontems (2008). Kinh tế học môi trường. Nhà xuất bản Trẻ. Hà Nội. 2008.
3. Nguyễn Đình Hòe (2008). Môi trường và phát triển bền vững. Nhà xuất bản Giáo dục. Hà Nội.
4. Hoàng Xuân Cơ (2008). Kinh tế môi trường, Nxb Đại học quốc gia Hà Nội.
5. Nguyễn Đình Hương (2007). Giáo trình kinh tế chất thải. Nhà xuất bản Giáo dục. Hà Nội.
6. Manfred Schreiner (2002). Quản lý môi trường con đường dẫn đến nền kinh tế sinh thái. Nhà xuất bản Xây dựng. Hà Nội.
7. Nguyễn Thế Chinh (2003). Kinh tế và Quản lý môi trường, Trường Đại học kinh tế quốc dân.
8. Võ Thị Minh Hoàng, Nguyễn Thị Tú Thanh (2016). Đánh giá giá trị du lịch – giải trí của khu dự trữ sinh quyển Cần Giờ sử dụng phương pháp chi phí du hành. Tạp chí Phát triển Khoa học và Công nghệ, 18 (T6/2015), 153.
9. Nguyễn Thị Vân Hà (2019). Lộ trình và giải pháp cho doanh nghiệp vừa và nhỏ Việt Nam tiếp cận mô hình kinh tế tuần hoàn. Hội thảo sản phẩm nhựa, Hà Nội ngày 28/11/2019.
10. Phạm Hồng Mạnh và Trương Ngọc Phong (2008). Ước lượng giá trị của việc cải thiện chất lượng môi trường tại cụm đảo Hòn Mun: Nhìn từ góc độ giải trí du lịch, Tạp chí Khoa học - Công nghệ Thủy sản, 04.