**Natural Resources and Environmental Economic – 3 credits**

(Selective course)

**Fall semester, 2020-2021**

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| 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.

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| **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):

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| **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.

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| **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***

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| --- | --- | --- | --- | --- |
| **Chapter** | **Description** | **Credit hours** | **Lectures** | **Practice and Discussion** |
| **Chapter 1** | Course description  Introduction on environmental and natural resources economics | 1  2 | 1  2 | 0 |
| **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:

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| --- | --- | --- | --- |
| **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 communicating and defending the ideas presented in report | Quality of group assignments and individual presentations | 15 |
| ***Total*** |  |  | ***113.75*** |

### Grading

The students’ performance will be based on the following:

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| 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:

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| --- | --- | --- | --- |
| **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. 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  1.5. Conflicts between economic development and environmental protection  1.6. Characteristics of economic models and associated limits | Nguyen Thi Van Ha; Nguyen Lu Phuong |
| 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  2.3. External cost  2.4. 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  - 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 | Nguyen Thi Van Ha; Nguyen Lu Phuong |
| 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  7.4.2 Evaluation methods for goods without market price | Nguyen Thi Van Ha; Su Thi Oanh Hoa |
| 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](http://www.google.com.vn/search?tbo=p&tbm=bks&q=inauthor:%22Scott+J.+Callan%22) and [*Janet M. Thomas*](http://www.google.com.vn/search?tbo=p&tbm=bks&q=inauthor:%22Janet+M.+Thomas%22) *(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](https://www.sciencedirect.com/science/journal/09608524" \o "Go to Bioresource Technology on ScienceDirect), 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 Thi ̣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.
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