# 高级自然资源经济学

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| **开课单位** | | 国家发展研究院 | | **授课教师** | 徐晋涛 |
| **课程编号** | |  | | **开课学期** | 2 |
| **上课时间** | | 每周二2-4节（9:00-12:00） | | **地点** | 保护生物学楼101 |
| **课程名称** | | 高级自然资源经济学 | | **周学时/**  **总学时** | 3/48 |
| **英文名称** | | Advanced Natural Resource Economics | | **学 分** | 3 |
| **先修课程** | | 中级微观经济学 | | **授课对象** | 博士与硕士生 |
| 课程简介（包括开课目的、开课基础与教学要求等）：  本课程分两部分：1）对自然资源经济学基本方法和基本问题进行回顾； 2）对学科经典和前沿文献进行阅读、整理和分析。  课程目标：使学生掌握学科所用基本方法、学科最新进展并为开展研究打下基础。  本课程要求具有中级微观经济学和微积分的基础知识。  考核以课堂参与、作业和课程论文为主。 | | | | | |
| **教材（作者、书名、出版社及出版年）：**  Jon Conrad,《Resource Economics》, Cambridge Press, (2nd edition), 2009 | | | | | |
| **参考书（作者、书名、出版社及出版年）：**  Conrad & Clark,《Natural Resource Economics: Notes and Problems》, Cambridge Press, 1995  Colin Clark,《Mathematical Bioeconomics》(2nd edition) , Wiley-Interscience Press, 2005  Caputo, M.R., 《Foundations of Dynamic Economic Analysis: Optimal Control Theory and Applications》, Cambridge University Press, 2005.  Clark, C.W., 《Mathematical Bioeconomics: The Optimal Management of Renewable Resources》, 2nd Edition, Wiley, 1990.  Dasgupta, P. and G.M. Heal, 《Economic Theory and Exhaustible Resources》, CambridgeUniversity Press, 1980. | | | | | |
| **课程内容** | | | | | |
| **序号** | **标题** | | **主要内容** | | |
| **1** | 基本概念  资源配置问题的数值求解 | | 自然资源与经济系统  拉格朗日方法、Kuhn-Tucker 条件  贴现率问题  可再生资源的最优利用问题  不可再生资源的最优开采路径问题  数值解法 | | |
| **2** | 动态优化方法介绍 | | 最优控制理论  动态规划方法  经济学解释 | | |
| **3** | 可再生资源（1）  森林资源 | | 森林资源管理的经济学原理  （木材利用、多种效益、采伐限额管理、原始林开发利用）  森林资源管理的经济学原理  （多种效益、原始林开发利用） | | |
| **4** | 可再生资源（2） | | 渔业资源利用的经济学分析  （开放进入、共有财产资源、传统管理政策、生物-经济学政策） | | |
| **5** | 不可再生资源 | | 资源利用的时间轨迹。  市场组织对资源采掘轨迹的影响：竞争性，垄断。 | | |
| **6** | 风险和不确定性 | | 成本效益分析  两阶段选择价值模型  无穷时间的选择价值模型  不可逆决策问题 | | |
| **7** | 可持续发展分析框架 | | 可再生资源利用模型  代际关怀模型  协同进化模型  自适应性发展模型 | | |
| **8** | 不可降解的污染问题（备选） | | 一般性问题，污染税、排污权交易  气候变化的经济学分析 | | |

**Advanced Topics in Resource Economics**

**1. Empirical Bioeconomics**

Wilen, J.E. (1976), “Common Property Resources and the Dynamics of Overexploitation: The Case of the North Pacific Fur Seal,” University of British Columbia, Resources Paper No. 3, September 1976.

Bjorndal, T., and J.M. Conrad (1987), “The Dynamics of an Open Access Fishery,” Canadian Journal of Economics 20:74-85.

Homans, F.R. and J.E. Wilen (1997), “A Model of Regulated Open Access Resource Use,” Journal of Environmental Economics and Management 32:1-21.

Smith, M.D. (2008), “Bioeconometrics: Empirical Modeling of Bioeconomic Systems,” Marine Resource Economics, 23:1-23, 2008

Junjie Zhang and Martin D. Smith. Estimation of a generalized fishery model: A two-stage approach. The Review of Economics and Statistics, 93(2):690–699, December 2011.

Abbott, J.K. and J.E. Wilen. “Dissecting the Tragedy: A Spatial Model of Behavior in the Commons.” Journal of Environmental Economics and Management 62 (2011): 386-401

**2. Spatial Models in Renewable Resource Economics**

Holland, Daniel S. and Richard J. Brazee (1996), “Marine Reserves for Fisheries Management,” Marine Resource Economics 11, 157-171

Sanchirico, J.N., and J.E. Wilen (1999), “Bioeconomics of Spatial Exploitation in a Patchy Environment,” Journal of Environmental Economics and Management 37:129-50.

Smith, M.D. and J.E. Wilen (2003), “Economic Impacts of Marine Reserves: The Importance of Spatial Behavior,” Journal of Environmental Economics and Management 46(2), 183-206.

Smith, M.D., J.N. Sanchirico, and J.E. Wilen (2007), “The Economics of Spatial-Dynamic Processes: Applications to Renewable Resources,” Selected Paper, Frontiers in Environmental Economics, Resources for the Future.

Brock, W. and A. Xepapadeas, Diffusion-Induced Instability and Pattern Formation in Infinite Horizon Recursive Optimal Control. Journal of Economics Dynamics and Control, (2008)

**3. Invasive Species – Spatial/ Spatial-Dynamic Problems**

Albers, H. J., C. Fischer, and J. N. Sanchirico. 2010. Invasive species management in a spatially heterogeneous world: effects of uniform polices. Resource and Energy Economics **32**:483-499.

Epanchin-Niell, R. S., and J. E. Wilen. 2012. Optimal spatial control of biological invasions. Journal of Environmental Economics and Management **63**:260-270

Fenichel, E. P., R. D. Horan, and J. R. Bence. 2010. Indirect management of invasive species with biocontrol: a bioeconomic model of salmon and alewife in Lake Michigan. Resource and Energy Economics **32**:500-518. 7

**4. Stock Pollutants and Climate Change**

Keeler, E., A.M. Spence and R. Zeckhauser (1972), “The Optimal Control of Pollution,” Journal of Economic Theory 4:19-34.

Falk, I. and R. Mendelsohn (1993), “The Economics of Controlling Stock Pollutants: An Efficient Strategy for Greenhouse Gases,” Journal of Environmental Economics and Management 25:76-88.

Newell, R.G. and W.A. Pizer (2003), “Regulating Stock Externalities under Uncertainty,” Journal of Environmental Economics and Management 45:416-432.

Chakravorty, U. J. Roumasset, and K. Tse (1997) “Endogenous Substitution among Energy Resources and Global Warming,” Journal of Political Economy 105, No. 6 pp. 1201- 1234.

**5. Economics of Non-Convex Ecosystems**

Dasgupta, P., and K.-G. Maler, "The Economics of Non-convex Ecosystems: Introduction," Environmental and Resource Economics, Special Issue Dec. 2003; 26(4): 499-525.

Maler, K.-G., A. Xepapadeas, and A. de Zeeuw, "The Economics of Shallow Lakes," Environmental and Resource Economics, Special Issue Dec. 2003; 26(4): 603-624.

**6. Green Accounting / Value of Natural Capital**

Dasgupta P and Maler K-G (2000) Net national product, wealth, and social well-being. Environ. Devel. Econ. 5: 69-93

Fenichel, Eli P., and Joshua K. Abbottb. "Natural capital: from metaphor to measurement." *Journal of the Association of Environmental and Resource Economists* 1, no. 1 (2014): 1-27.

Weitzman ML (1976) On the welfare significance of national product in a dynamic economy. Q J Econ 91: 156-162

**7. Empirical Analysis of Resource Scarcity and Measuring Sustainability**

Hall, D.C. and J.V. Hall (1984), “Concepts and Measures of Natural Resource Scarcity with a Summary of Recent Trends,” Journal of Environmental Economics and Management 11:363-379.

Halvorsen, R. and T.R. Smith (1991), “A test of the theory of exhaustible resources,” Quarterly Journal of Economics 106:123-140.

Slade, M.E. and H. Thille (1997), “Hotelling Confronts CAPM, A Test of the Theory of Exhaustible Resources,” Canadian Journal of Economics 30:685-708.

Asheim, G.B. (1994), “Net National Product as an Indicator of Sustainability,” Scandinavian Journal of Economics 96:257-265