

Course title <English>	生物資源經濟学特別講義 IIIB Special Lecture on Natural Resources Economics IIIB		Affiliated department, Job title,Name	Part-time Lecturer,Xiaohua Yu	
Grade allotted	1st year students or above	Number of credits	1	Course offered year/period	2016/Intensive, Second semester
Day/period	Intensive	Class style	Lecture	Language	English
[Outline and Purpose of the Course]					
Some basic math techniques are crucial for a proper understanding of modern literature of agricultural economics, resource and environmental economics, as more and more mathematics is introduced into economic literature. The course will offer some basic techniques related to economic analysis and optimization (including static and dynamic optimization).					
[Course Goals]					
This course is designed to help graduate-level students in agricultural economics at Kyoto University understand some basic math tools for the analysis in agricultural economics, development economics, farm management, and environmental and resource economics.					
[Course Schedule and Contents]					
<p>Course Outline</p> <p>1 Introduction</p> <p>2, Differentiation and Implicit Function</p> <ul style="list-style-type: none"> • Differentiation • Partial Differentiation • Comparative Static Analysis • Implicit Function • Homogenous Functions • Homothetic Functions • Maclaurin and Taylor Series <p>3 Optimization without constraints</p> <ul style="list-style-type: none"> • First-Order Condition • Second-Order Conditions • Concavity and Convexity • Envelope Theorem • Duality and Theorem <p>4 Optimization with Equality constraints</p> <ul style="list-style-type: none"> • Langrange-Multiplier Methods • Second-Order Conditions • Quasiconcavity and Quasiconvexity • Application to uncertainty analysis <p>5 Optimization with Inequality constraints</p> <ul style="list-style-type: none"> • Kuhn-Tucker Conditions • Constraint Qualifications • Sufficiency Theorems in Non-linearity • Application to contract analysis <p>6 Discrete Dynamic Programming</p> <ul style="list-style-type: none"> • Bellman Equation • Overlap-Generation Model 					
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生物資源經濟學特別講義 III B(2)

- Application to none-renewable resources
- 7 First-order Differential Equations
- First-Order Linear Differential Equations
 - Exact Differential Equations
- 8 Optimal Control Theory
- Alternative Terminal Conditions
 - Infinite Time Horizontal
 - Application to renewable resources
- 9, Some Numeric Methods
- Newton ' s Method
 - Runge-Kutta Method

[Class requirement]

Participation and homework

[Method, Point of view, and Attainment levels of Evaluation]

participation (20%), exam (50%) and homework (30%)
Refer to '2016 Guide to Degree Programs' for attainment levels of evaluation.

[Textbook]

1. Chiang A. and K. Wainwright, Fundamental Methods of Mathematical Economics, (4ed..) McGraw-Hill. 2004
2. Dixit A. Optimization in Economic Theory, Oxford University Press, 1990.
3. Takayama A. Analytical Methods in Economics, U Michigan Press, 2000.
4. Sundaram R. K. A First Course in Optimization Theory, Cambridge U. Press, 2007.

[Reference books, etc.]

(Reference books)

Reading Lists

Part I, Agricultural and Development Economics

*1, Mortensen D. T. and C. A. Pissarides (1994) " Job Creation and Job Destruction in the Theory of Unemployment, " Review of Economic Studies, 61:397-415.

*2, Lucas R. (2004), Life Earnings and Rural-Urban Migration, Journal of Political Economy, 2004, vol. 112, no. 1, pt. 2

*3, Hanse G. and E. Prescott (2002), Malthus to Solow, American Economic Review, 1205-1217

4, Atkeson A. and A. T. Burstein (2010) " Innovative, Firm Dynamics and International Trade, " Journal of Political Economy, 118:435-484.

5, Holmstrom B. 1979, " Moral hazard and Observability " , the Bell Journal of Economics, 10:74-91.

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生物資源經濟學特別講義 III B(3)

6, Gary S. Becker; Robert J. Barro (1988) " A Reformulation of the Economic Theory of Fertility " The Quarterly Journal of Economics, Vol. 103, No. 1. (Feb., 1988), pp. 1-25.

Part II Environmental and Resource Economics

7, *Wu J. , 2006, Environmental amenities, urban sprawl, and community characteristics, Journal of Environmental Economics and Management 52 (2006) 527-547

8, *Andersen P. 1982, Commercial Fisheries Under Price Uncertainty, Journal of Environmental Economics and Management, vol. 9:11-28.

9, *Tahvonen O, and S. Salo (1999) " Optimal Forest Rotation with in Situ Preferences " . Journal of Environmental Economics and Management, vol. 37:106-128.

10, Tahvonen O., Seppo Salo and Jari Kuuluvainen (2001) Optimal forest rotation and land values under a borrowing constraint, Journal of Economic Dynamics and Control , 25:1595-1627.

[Regarding studies out of class (preparation and review)]

Basic calculus

(Others (office hour, etc.))

Office hour: by appointment

*Please visit KULASIS to find out about office hours.