ENV-723

# Models for applied environmental economics

Vöhringer Frank

| Cursus | Sem. | Type |
|---|---|---|
| Civil & Environmental Engineering | | Obl. |

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|---|---|
| Language of teaching | English |
| Credits | 1 |
| Session | |
| Exam | Oral presentation |
| Workload | 30h |
| **Hours** | **13** |
| Courses | 13 |
| **Number of positions** | |

## Frequency

Every 2 years

## Remark

Next time: Every two years / next time spring 2019, min 5 participants

## Summary

Mainly based on the discussion of peer reviewed academic papers, the course introduces non economists to the main types of applied models used in environmental economic analysis: linear programming, partial and general equilibrium, game theory, and agent based models.

## Content

For each type of applied environmental economic model, there is a brief general introduction, followed by a discussion of a peer-reviewed academic paper on an applied topic using that type of model.
Families of models presented and discussed:
- Linear programming (paper topic: urban pollution; model features in paper: spatial)
- Partial equilibrium (paper topic: timber industry and wildlife conservation; model features in paper: integrated assessment)
- Computable general equilibrium (paper topic: carbon taxes; model features in paper: multi-regional)
- Game-theoretic (paper topic: climate negotiations; model features in paper: cooperation)
- Agent-based (paper topic: diffusion of plug-in hybrid vehicles; model features in paper: spatial, stochastic)

## Note

This course does not require any prior economic knowledge, but it is easier for those who attended ENV-615 "Environmental Economics for Engineers" or ENV-620 "Environmental Economics for Engineers (2018)".
It will only be given for a minimum of 5 students.

## Keywords

environmental economics
economic modeling

## Learning Prerequisites

### Recommended courses

ENV-615, Environmental Economics for Engineers (before 2018) or
ENV-620 Environmental Economics for Engineers (2018)". (after 2018)

## Learning Outcomes

By the end of the course, the student must be able to:

- to understand the differences between simulation and optimisation models
- to describe the main characteristics of each model type
- to discuss the main merits and limitations of each modeling approach
- to recognize attributes of well written papers

## Resources

### Bibliography

Nalle, D.J. et al. (2004): Modeling joint production of wildlife and timber, Journal of Environmental Economics and Management 48, 997-1017.
Beck, M. et al. (2015): Carbon tax and revenue recycling: Impacts on households in British Columbia, Resource and Energy Economics 41, 40-69.
Eppstein, M.J. et al. (2011): An agent-based model to study market penetration of plug-in hybrid electric vehicles, Energy Policy 39, 3789-3802.