

# Course Outline

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| <b>COURSE TITLE</b>     | Nature and Environment |
| <b>NAME OF LECTURER</b> | Dieter Genske          |

## **COURSE DESCRIPTION**

This course introduces students to the dimensions and consequences of climate change. Since the majority of people already live in urban areas, the effects of climate change on cities will be discussed and mitigation measures introduced. Particular attention will be paid to the vulnerability of cities and their resilience to climate change. Passive and active measures will be introduced, including the introduction of renewable energy options to de-fossilize cities, thereby reducing their emissions of greenhouse gases. The concept of creating Plus-Minus regions is presented, i.e. regions that produce more renewable energy than they need and absorb more carbon than they emit. The results will be transferred to the city of Daegu, and an atlas will be produced highlighting the city's vulnerability and resilience to climate change, as well as the potential for de-fossilization through the introduction of the renewable energy option.

## **RECOMMENDED READINGS**

Course material will be handed out, including the class presentations and reports on urban transformation efforts prepared by the applicant. Of particular interest will be the article: Droege P, Genske DD, Ruff AA, Schwarze M (2018) Building Regenerative Regions Rapidly: The STAR Energy Model as Regional Planning Tool. In: P. Droege (ed.) Urban Energy Transition: Renewable Strategies for Cities and Regions. Elsevier Amsterdam: 579-634 (2nd Edition).

## **TEACHING METHODS**

The course will be a mixture of a classical lecture, discussion sessions and project work. In the first week I will present an introduction to "Cities and Climate Change". The second week will focus on the vulnerability, the resilience and the de-fossilization potentials of the City of Daegu. The third week will focus on the formulation of recommendations and the production of an atlas illustrating the findings.

## **ASSESSMENT METHODS**

The grade will be composed of: 20 short written test at the beginning of the second week  
40 oral presentation, 40 written contribution to the atlas-project.

## **CLASS TOPICS** *(each class is 3 hrs)*

- (1) Dimensions and impacts of climate change
- (2) Vulnerability of cities to climate change
- (3) Resilience of cities to climate change
- (4) De-fossilization potentials of cities
- (5) Strategy of mitigation measures
- (6) Vulnerability, the resilience and the de-fossilization potentials: International case files 1
- (7) Vulnerability, the resilience and the de-fossilization potentials: International case files 2
- (8) Vulnerability, the resilience and the de-fossilization potentials: Application to the City of Daegu 1
- (9) Vulnerability, the resilience and the de-fossilization potentials: Application to the City of Daegu 2
- (10) Vulnerability, the resilience and the de-fossilization potentials: Application to the City of Daegu 3
- (11) Production of a report with recommendations and an atlas to illustrate the results for the City of Daegu 1
- (12) Production of a report with recommendations and an atlas to illustrate the results for the City of Daegu 2

- (13) Production of a report with recommendations and an atlas to illustrate the results for the City of Daegu 3
- (14) Production of a report with recommendations and an atlas to illustrate the results for the City of Daegu 4
- (15) Conclusion and feedback.

**SPECIAL COMMENTS**