Overview
Innovation drives growth and job creation in modern economies. A major share of the new knowledge on which innovation is based derives from scientific research. Understanding the economics of science and the processes in which new scientific knowledge is transferred to the economy is therefore of major importance to explain and possibly improve innovation performance. At the same time, knowledge is a good with rather unusual economic properties, which raises various types of externality and incentive problems. With the system of Open Science, a specific set of institutions has developed over time to address these issues. Studying Open Science therefore helps economists to better understand the working of competitively self-governing societal subsystems outside the sphere of traditional markets. It is therefore little surprising that a burgeoning literature deals with the economics of science. The course will provide an introduction into this literature.

The course combines a lecture part (about the first 60% of the term) with seminar sessions in which students present and discuss selected recent articles in the economics of science and technology.


Requirements (6 ECTS Credits):
- Successful completion of a mid-term exam (pass/fail)
- Seminar paper (about 15 pages; due date September 30, 2015) plus oral presentation (about 20 minutes)
- Attendance and active participation in the seminar sessions (dates will be announced)

Registration and choice of topics by E-Mail to buenstorf@uni-kassel.de (starting immediately; please name three preferred topics).

Maximum number of participants: 30
Part 1: Lecture

A. Introduction

1. Research and Development in Germany
   1.1 The OECD Classification Scheme of Research and Development
   1.2 Research and Development and German Federalism
      1.2.1 Universities and Non-University Public Research
      1.2.2 Industrial Research and Development
   1.3 Current Trends and Challenges in the German R&D System
      1.3.1 Shifts in Funding
      1.3.2 The Quest for Excellence and Managerial Efficiency
      1.3.3 Pitfalls of Federalism

B. Economics of Science

2. Knowledge as an Economic Good
   2.1 Production and Reproduction of Knowledge
   2.2 The “Knowledge Dilemma” and Its Solutions

3. The Reward System of Open Science and the Production of New Scientific Knowledge
   3.1 Open Science: Disclosure, Priority and Reputation
   3.2 The Evolution of Open Science: a Brief Historical Overview

4. The Motivation of Individual Researchers
   4.1 Motivation and Incentives
      4.1.1 Intrinsic and Extrinsic Motivation
      4.1.2 Monetary Incentives
      4.1.3 Peer Review, Publication and Citations
      4.1.4 Prizes and Awards
   4.2 The Behavior of Scientists: Conceptual Models
      4.2.1 The Lifecycle Model
      4.2.2 Positive Feedback (Matthew Effect)
      4.2.3 Scientific Entrepreneurship

5. The Production Process of Science
   5.1 Collaborative Research
   5.2 Capital in Scientific Production: Equipment and Materials
   5.3 Labor Markets for Scientists and Engineers
5.3.1 International Migration  
5.3.2 Gender and Science  
5.3.3 Recruitment of Young Researchers and the Reproduction of Science

6. Current Trends and Challenges to Open Science  

6.1 Globalization  
6.2 Digitalization  
6.3 Scientific Misconduct and the Reliability of Research

Teil C. Knowledge and Technology Transfer

7. Science and Economic Development: the Big Picture  

7.1 Models of Science and Innovation  
7.2 Economic Effects of Science: Empirical Evidence  
7.3 Basic Research in Private-Sector Firms: Anomaly or Necessity?

8. Channels of Knowledge and Technology Transfer  

8.1 Overview and Relative Importance  
8.2 Mobility of Graduates and Researchers  
8.3 University-Industry Collaboration and Networks  
8.4 Intellectual Property Rights on University Inventions  
8.5 Academic Entrepreneurship

9. The Institutional Framework of Knowledge and Technology Transfer  

9.1 Science Between Autonomy and External Steering  
9.2 Technology Transfer and Science Policy  
9.2.1 The Bayh-Dole Act  
9.2.2 Germany’s Verwertungsoffensive  
9.2.3 Current Developments

10. Effects of Technology Transfer on Scientific Progress  

10.1 Technology Transfer and Individual Productivity  
10.2 Technology Transfer and the Diffusion of Knowledge
Topics for Seminar Papers

1. Career Imprints in Science: Professor Quality and the Outcomes of Doctoral Education


2. Human Capital and Physical Capital in Science: Evidence from the Legacy of Nazi Germany


3. Mobility and Productivity: Soviet Immigrants and Academic Mathematics in the U.S.


4. Who Is (not) an Author? Evidence for Scientific Publications and Patents


5. The Matthew Effect in Science: An Empirical Test


6. The Impact of “False Science”: Evidence from Retracted Articles


7. Crowd Science: Non-Scientists’ Involvement in Research Projects


8. Online Education and the Industrial Organization of Public Research


9. Citation Metrics and Labor Market Outcomes of Academic Economists

10. The Spatial Diffusion of Scientific Knowledge


11. Social Learning and Academic Entrepreneurship


12. What restricts the Commercialization of University Research?


13. Secrecy and Delay in Disclosure of Industry-Sponsored Research


14. The Bayh-Dole Act – Really a Good Idea?


15. Institutional Responses to Patented Research Tools: the Case of the Oncomouse