

## **BIWE-07: Computational Building Physics (Prof. Grunewald)**

### **Contents**

- 1) Indoor climate design
  - Climate based building design (theory and history)
  - Heat transport and storage
  - Radiation and convection
  - Environmental and indoor loads
  - Ventilation
  - Calculation of thermal indoor climate
    - Thermal room balance
    - Thermal room climate simulation software
  - Building simulation with EnergyPlus and DesignBuilder
    - EnergyPlus concepts
    - Creating projects with DesignBuilder
    - Simulation Exercises
  - Thermal bridges
    - Theory
    - Calculation with THERM
  - Lighting

### **Prerequisite Knowledge**

- Sufficient and applicable knowledge in the basics of building physics
- Basic knowledge in numerical methods

### **Topics of Project and Master Thesis**

- Energy optimization of buildings in hot climate zones by use of whole building simulation software

### **Literature**

For program downloads and literatures check:

- <http://www.bauklimatik-dresden.de/>
- <http://www.eere.energy.gov/buildings/energyplus/>
- <http://www.designbuilder.co.uk/>
- <http://windows.lbl.gov/software/therm/therm.html>