ARCH 6241 (Spring 2018)
Building Simulation in Design Practice

Course
ARCH 4240/6241: Building Simulation in Design Practice
CRN: 29618/26228
Time: T/R 10:00-10:45, location TBD
Labs: THU 12:2:45 and one full week training (dates TBD)

Instructor
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Course Objectives
Get familiar with mainstream simulation packages to support building design, audit and calibration at various levels of fidelity in the following domains: Solar, Energy, Air Flow and Ventilation, Lighting, Passive Design
Software packages from which we will choose: Ecotect, EPC Calculator, eQuest, Radiance, DIVA, EnergyPlus, CONTAM, IES-VE, Comfy, Umi and others

Relationships
The course develops the skills necessary for professional use of simulation software both in practice as well as in graduate studies and research projects

Prerequisite
ARCH 6226: Green Construction (Fall 2016)
Exceptions can be made for students that can prove mastery of engineering analysis in various building technology domains, i.e. energy/HVAC, lighting, visual and thermal comfort.

Learning Objectives
Use selected simulation software packages at a beginner’s to intermediate level.
Be able to apply them in real life projects.

Procedure
Students will get training in class and through software tutorials and webinars. Students will apply the full palette of tools on a selected, monitored GT campus building

Required readings
To be suggested during class: mostly software manuals and tutorials and background studies on simulation software

Teaching approach and Assignments
Lectures will be mostly devoted to class teaching’ The lab sessions are reserved for tutorial and hands-on team work. Incremental simulation assignments:
- Professional site climate analysis: solar, wind and daylight studies
- Simplified whole building energy modeling
- Application: Campus audits and optimal selection of ECM
- Dynamic simulation studies, with focus on one of more of the following:
  - The use of natural ventilation
  - Calibration of building energy models
  - Building control studies

Grading
(1) Based on individual report, incrementally developed over the semester. Throughout the semester students will work on one building and add incremental extensions dealing with first order assessment, dynamic simulation at increasing levels of fidelity, audit, and calibration with monitored data.
(2) Final assignment: expert study, looking at an advanced topic of building performance, requiring a dedicated simulation

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