

Course- Online Course

BUILDING PERFORMANCE ANALYSIS SUMMER WORKSHOP

Location: **Online**
Instructor: **Prof. M.T.Chang, Phd.**
Office: **By appointment**

COURSE DESCRIPTION

Through a case study example, fundamental theory, quizzes, and software documentation, learn the foundations of building performance analysis & design. This course will better prepare students to conduct energy analysis in subsequent Autodesk Energy Analysis/Lighting Analysis for Revit. Students will learn to associate physical processes to energy simulation methods to prepare for software tool use and gain a basic fluency around whole building energy analysis through dynamic simulation.

According to the AIA 56% of architecture firms are having difficulty finding employees with sustainable design skills. They want people who can design a truly energy efficient, high-performance building and understand how to use the latest software tools to do so.

*The BPA workshop is designed to give you the skills required to help drive an industry-wide transition to performance-based sustainable design.

COURSE OBJECTIVES

This course will introduce students to using software tools such as Autodesk Energy Analysis/Lighting Analysis tools, and Sefaira for Revit. The class will introduce essential software concepts and hands-on operations. Hands-on exercises will lead students through the software interface, BPA performance flows, energy model design, and analysis:

- Introduction to BPA Certificate
- Energy Literacy & Building Loads
- Climate & Weather Analysis
- Solar Measurements & Strategies
- Wind & Airflow Strategies
- Daylighting Strategies & Analysis
- Whole Building Energy Analysis with Revit

This course is comprised of a series of self-paced online tutorials, class lectures, quizzes and Autodesk software exercises.

COURSE FORMAT

This course is designed to be accessed once a week with quizzes, online exercises, and homework assignments. Some lectures will be presented in each session. Selected guest speakers from Autodesk will present their use of the program in YouTube. As an option, students can creatively use this class as an opportunity to integrate their own projects; however, this course's main focus is to introduce sustainable building performance simulation and analysis.

SOFTWARE AND HARDWARE

The course is held online, which you will need to have access to the program. However, it is also highly recommended you install Autodesk Revit 2018 and Insight plugin (FREE for students from the Autodesk web- site) on to your personal computers. MAC users: please install Windows using Bootcamp (It is highly recommended to not use Parallels, VMware and other dual operating systems due to Revit's

intensive utilizations of system resources.)

EVALUATION

This is a three credit course that will take up roughly 40 hours in this term in class.

Please keep this in mind as the required commitment from you for this course.

Assignments

Assignments will be graded based on how well they show understanding of the specific learning objectives; thoroughness, completeness, and care in completing the exercise; graphic and aesthetic quality; seeking out help when necessary.

On most assignments it will be possible to go beyond the minimum requirements, explore additional features of the software, and take the assignment further. This is recommended, and will be considered in grading. There will be a limited number of extra credit assignments.

The assignments will be to create a small vignettes of building simulation diagrams, analysis diagrams, and data about various types of building in different situations. Student building excises files will be submitted each week for review and should clearly demonstrate understanding and practice of the topics discussed the previous week. At the end of the term all the building simulation analysis on their final project will be brought together in one class presentation to show how to use collaboration in the program.

Participation

The class is an entirely online course. You will diligently do class activities every week, in order to pass a course. Please keep this in mind as the required commitment from you for this course.

We don't meet in a classroom setting, but you are required to go to our class room website to complete all necessary components in order to receive a passing grade.

Class Information

You need to obtain a Gmail account to use Google drive. You need to submit your assignments on to the Google drive every week. YOU WILL NOT ABLE TO PASS THIS COURSE, IF YOU DIDN'T SHARE YOUR ASSIGNMENTS ON YOUR GOOGLE DRIVE WITH US. You fail to share your works with us, and it means that you fail to do your assignments. There will be a submission form for you to submit your works online.

Quiz will be throughout every session! You can try as many times to pass, but only the last four attempts will be recorded. You will NOT get any score, if you fail to pass any quiz more than 4 times. Please see grading policy for further explanation.

100% Online Course

Online Activities submissions are required on every online activity. Submission deadline is from different every week. Please see your online component.

Grade Breakdown

See Grading Policy.

(Note: Late assignments may be accepted at the instructor's discretion, for a reduced score.)

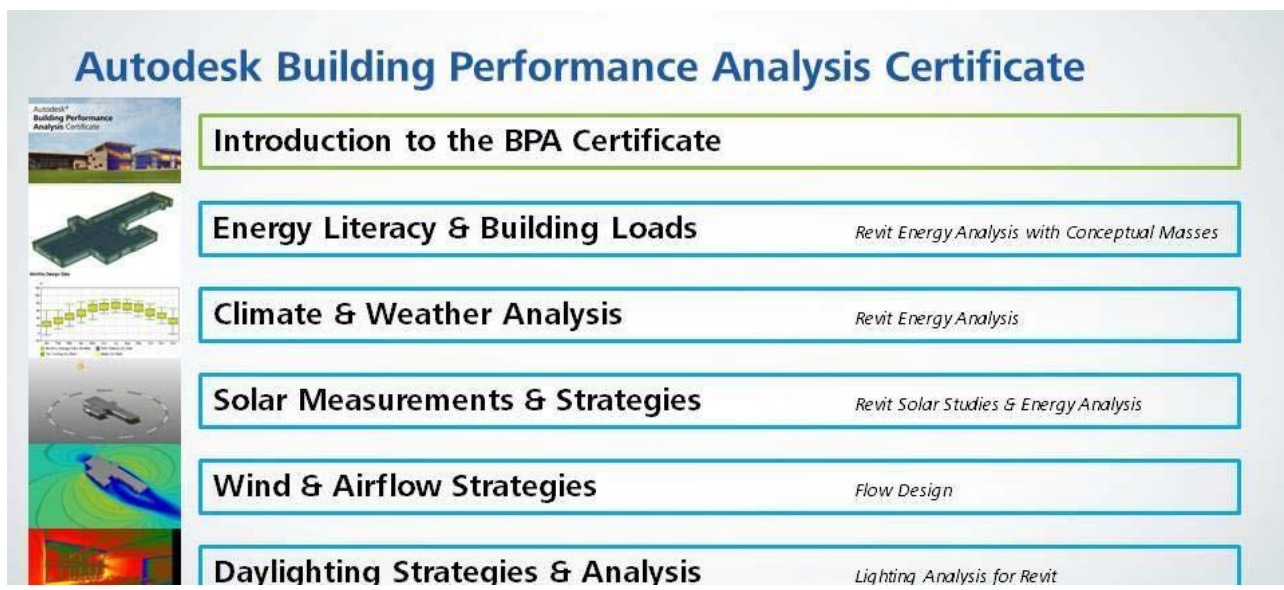
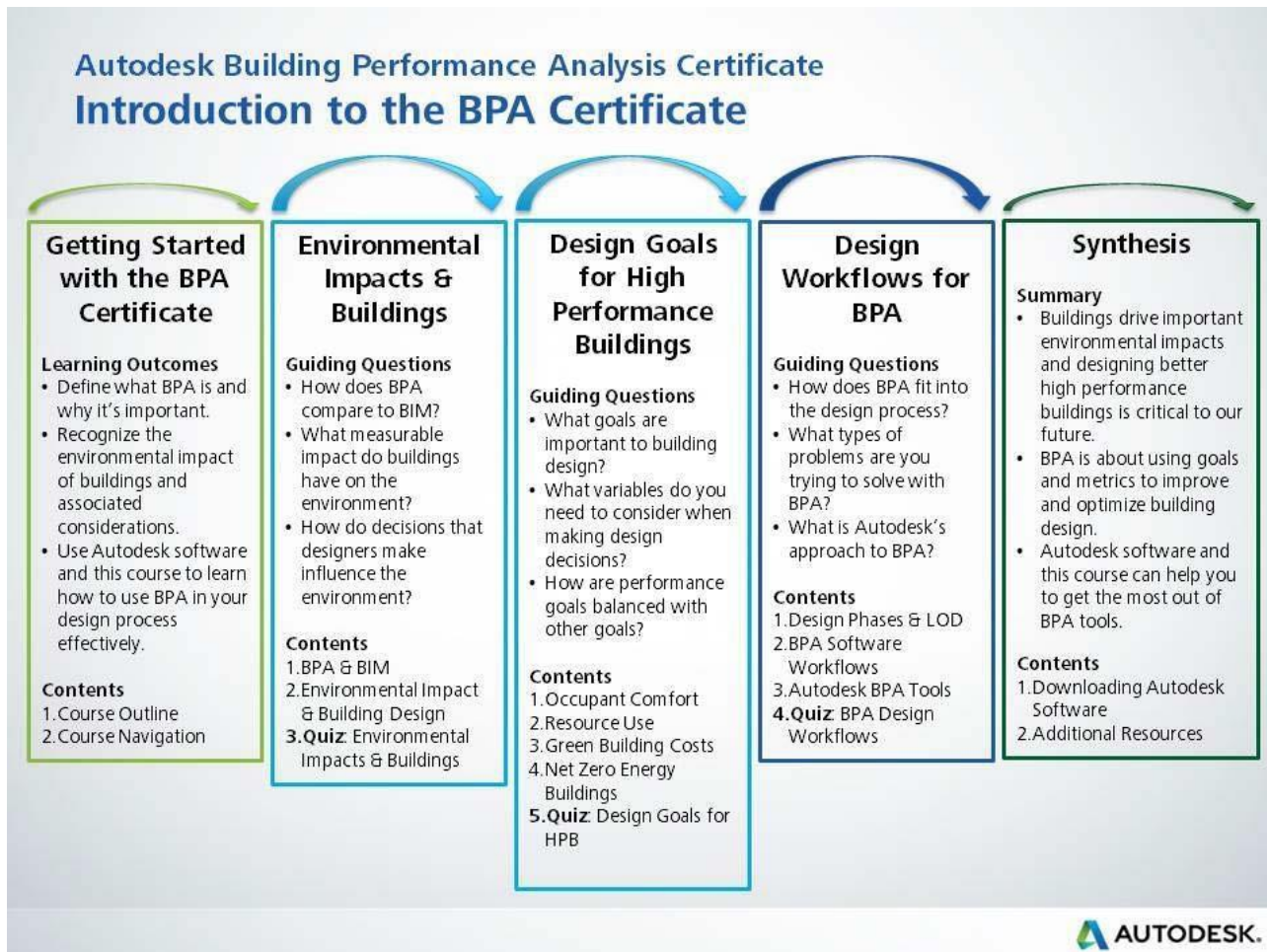
RECOMMENDED BOOKS

kjell, Anderson. Design Energy Simulation for Architects. Routledge. 2014.

Hardin, Brad. BIM and Construction Management: Proven Tools, Methods, and Workflows 2nd Edition. John Wiley & Sons, Inc. 2015.

Autodesk Efrontlearning:

Academic Misconduct: The University Student Conduct Code (available at conduct.uoregon.edu) defines academic misconduct. Students are prohibited from committing or attempting to commit any act that constitutes academic misconduct. By way of example, students should not give or receive (or attempt to give or receive) unauthorized help on assignments or examinations without express permission from the instructor. Students should properly acknowledge and document all sources of information (e.g. quotations, paraphrases, ideas) and use only the sources and resources authorized by the instructor. If there is any question about whether an act constitutes academic misconduct, it is the students' obligation to clarify the question with the instructor before committing or attempting to commit the act.



Each course is divided into sections. All courses have an *Introduction* and *Synthesis*.

Arrows at the top denote how much content is in each section. Smaller arrows mean less content, larger arrows mean more content, and potentially more time required for the section.

Autodesk Building Performance Analysis Certificate
Introduction to the BPA Certificate

Getting Started with the BPA Certificate	Environmental Impacts & Buildings	Design Goals for High Performance Buildings	Design Workflows for BPA	Synthesis
Learning Outcomes • Differentiate BPA and WHYOT. • Recognize the impact of building wings and the building footprint. • Understand the Autodesk software and how to use BPA in your design process. Contents 1. Course Overview 2. Course Navigation	Guiding Questions • How does BPA compare to BIM? • What is the impact of building wings and the building footprint? • How does BPA help in the design process? Contents 1. BPA & BIM 2. Environmental Impact & Building Design 3. Quiz: Environmental Impacts & Buildings	Guiding Questions • What are the design goals for high performance buildings? • What are the design goals for high performance buildings? • How does BPA help in the design process? Contents 1. Occupant Comfort 2. Resource Use 3. Green Building Costs 4. Net Zero Energy Buildings 5. Quiz: Design Goals for HPB	Guiding Questions • How does BPA help in the design process? • What are the design goals for high performance buildings? • How does BPA help in the design process? Contents 1. Design Phases & LOO 2. BPA Software 3. Workflow 4. Quiz: BPA Workflow	Summary BPA is a tool that helps you understand the impact of building wings and the building footprint. BPA helps you understand the impact of building wings and the building footprint. BPA helps you understand the impact of building wings and the building footprint. Contents 1. Overview 2. Add the Building Footprint

The Learning Outcomes, Guiding Questions, and Summaries give an overview of what you can expect to learn.

The contents of each section are outlined below. This shows where there are quizzes and exercises.