Since the beginning of the sustainable architectural design movement, architects and engineers have been interested in finding optimized building shapes. In the past, it was a great challenge to find the optimal design to reduce the energy demand for heating, cooling and artificial lighting. Modern computer simulation tools allow us to predict these energy demand values. In the future, evolutionary optimization algorithms, will help us to find optimized façade designs and building shapes. These designs are combining principles of esthetics, sustainability and human comfort.

Goal of this course is to learn how to design optimized sustainable buildings in different climate regions. In the first part, the use of dynamic simulation tools will be taught. Students will learn sustainable design aspect in an empirical way. The second part is focused on a small research project, where generic optimization tools will be used. Students will work in small groups. Students are welcome to work on a façade or building project. The simulation tools used in this class are: Grasshopper, Rhino.