**Degree requirements for Master's degree in Real Estate Energy (60 ECTS)**

**Overall competences**

A student completing the whole program will have unique competencies to plan energy balance associated retrofitting for any building in the most cost efficient and sustainable manner. Foundation of knowledge and competence is given by the energy diagnosis module and complemented by an elective study module according to a person's own interests. Master thesis will give experience on how to gather, evaluate relevance and apply information influencing the overall benefit of various alternatives on the sustainability of retrofitting.

## The structure of the studies

# Advanced studies (30 ECTS)

Professional studies consist of two study modules of which one is elective. The compulsory module is associated to energy diagnosis methodology.

## ENERGY DIAGNOSIS AND INDOOR COMFORT (15 ECTS)

**Learning outcomes**

Upon completing this module, a student is able to create understandable report to a real estate owner/construction company for retrofitting of both thermal efficiency and indoor comfort. Significant part of the module focuses on giving skills in conducting measurements precisely and utilization of measured data for various simulations.

**In the module the following courses are included**

| | |
|---|---|
| Energy diagnosis measurements | 5 |
| Energy diagnosis data analysis and reporting | 5 |
| Indoor comfort and simulations | 5 |

## ELECTIVE STUDIES (15 ECTS)

Student can choose an elective study module based on the career profile. Among different alternatives a module giving one of the competencies is recommended: building physics, portfolio management, finance, future energy technologies and Adaptation with changing climate with modern materials. All these are accessible via student mobility except Adaptation to changing Climate and modern Materials which is organized by Arcada.

**Adaptation with changing climate with modern materials**

**Learning outcomes**

Upon completing this module a person knows what are the expected changes in the local climate and that will influence building physical performance of the building elements. By knowing physical demands and advanced materials available for constructions novel

expertise is achieved. Subsequently, abilities are formed allowing creation of holistic approaches with cost efficiency and architecturally gentle changes.

**In Adaptation with changing climate with modern materials the following courses are included**

| | |
|---|---|
| Local climate change and impacts on building physics | 5 |
| Modern materials for insulation | 5 |
| Modern materials for energy management | 5 |

# Master's Thesis (30 ECTS)

The master's thesis is an individual piece of work in the form of an empirical research and development project. The student shows her capability of systematically performing a study with a possible practical problem as a starting point. This practical problem is then formulated as a research problem and is solved by a specific purpose with possible related research questions. The student is able to use relevant existing knowledge of the studied phenomena and can create a structural and logic theoretical framework for the study. The student can decide to conduct the master's thesis with a commissioner, for example the employer.

**The study module consists of the following studies**

| | |
|---|---|
| Master Thesis and research seminars | 30 |