# AI2135 Financial Investments 7.5 credits

**Finansiell Ekonomi**

This is a translation of the Swedish, legally binding, course syllabus.

## Establishment

The course syllabus is valid from Autumn 2025 according to decision of the Director of First and Second Cycle Education: HS 2025-0745, 3.2.2Decision date: 2025-04-08

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

Second cycle

## Main field of study

Industrial Management, The Built Environment

## Specific prerequisites

Knowledge of quantitative methods equivalent to the content of the course AI2152, confirmed by at least 3 approved credits in this course.

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

After the completion of the course, students should be able to:

- Describe and explain the fundamental relationship between risk and return in financial markets and how investors can diversify risk and further understand and apply statistical measures of risk in applications such as portfolio optimization and estimation of asset pricing models.
- Describe, explain, compare and critically discuss how the risk premium of individual assets are determined in different asset pricing models such as the CAPM and multi-factor models and, through group work, apply these models empirically by estimating both single- and multi-factor models and analyze the output of the estimated models.
- Explain and critically discuss the implications for the pricing of assets of the efficient market hypothesis as well as hypotheses based on market inefficiency and irrational investor behavior.
- Describe and explain the theory and models for valuation of financial and real options and, through group work, apply the theory and the models by constructing computer-based models for valuation of financial and real option. Real options are treated with the focus on optimal timing of real estate investments considering sustainable development, i.e., to invest in the optimal use of the property, in optimal quantity and at an optimal point of time considering a long-term optimal use of resources.

## Course contents

The concept of financial risk. Statistical measures of risk. Systematic and unsystematic risk. Diversification of risk and portfolio theory. The relationship between risk and return. Single and multi-factor asset pricing models. Market efficiency and inefficiency. Option valuation and Black and Scholes formula. Risk-neutral option valuation. Valuation of real options. Binomial option valuation models.

## Examination

- TEN2 - Written exam, 5.0 credits, grading scale: A, B, C, D, E, FX, F
- PRO1 - Project, 2.5 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

The project shall be made in groups, but the students are examined on an individual basis. Students must complete the project work within the time limit given by the head teacher in order pass the project. Students who fail the project may be examined again during the following re-exam period.

## Other requirements for final grade

Project work (PRO1), 2.5 hp, with grade P and written exam (TEN2), 5 hp, with grade E or higher. If these requirements are fulfilled, the final grade on the course will be the same as the grade on the written exam (TEN2).

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.