

# COURSE DETAIL

## NUMERICAL ANALYSIS: NUMERICAL APPROXIMATION

**Country**

Sweden

**Host Institution**

Lund University

**Program(s)**

Lund University

**UCEAP Course Level**

Upper Division

**UCEAP Subject Area(s)**

Mathematics

**UCEAP Course Number**

160

**UCEAP Course Suffix****UCEAP Official Title**

NUMERICAL ANALYSIS: NUMERICAL APPROXIMATION

**UCEAP Transcript Title**

NUMERICAL APPROXMTN

**UCEAP Quarter Units**

6.00

**UCEAP Semester Units**

4.00

## Course Description

The fundamental problem of approximation theory is to represent a possibly complicated function by simpler, easier to compute functions. In approximation theory it is usually assumed that the values of the function are known. This information is then used to construct an approximant. In numerical computation, information usually comes in a less explicit form. For example, the function may be the solution to a differential equation. Nevertheless, the two subjects of approximation and computation are closely related, and it is impossible to understand fully the possibilities in numerical computation without a good understanding of the elements of constructive approximation. This course gives an overview of basic classical approximation theory, i.e., best and good approximation from a finite family of functions in specific normed linear spaces (such as  $L_1$ ,  $L_2$ , and  $C$ ). Minimax approximation and the construction of good approximations (the exchange algorithm) are studied. Also covered are orthogonal polynomials and least squares approximation. The results and techniques from approximation theory and numerical analysis are applied in both the continuous and the discrete cases. The theory is illustrated mainly by considering numerical approximation techniques by polynomials and splines.

## Language(s) of Instruction

English

## Host Institution Course Number

NUMN19

## Host Institution Course Title

NUMERICAL ANALYSIS: NUMERICAL APPROXIMATION

## Host Institution Campus

Science

## Host Institution Faculty

## Host Institution Degree

## Host Institution Department

## Mathematics

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