



UMEÅ UNIVERSITY

## **Classical articles in computational mathematics**

*(Klassiska artiklar i beräkningsmatematik)*

### **Course organizer and lecturer**

Department of Mathematics and Mathematical Statistics  
Siyang Wang, siyang.wang@umu.se

**Course credits:** 7.5 ECTS

Level: PhD

Main Field of Study: Mathematics

Grading Scale: Pass, Fail

**Course period:** August 2022 – January 2023

### **Prerequisites**

This will depend on the selected articles, which will adapt to the students. Some general knowledge in computational mathematics would be helpful, such as linear algebra, differential equations, and numerical methods.

### **Objective**

The main objective is to get an overview of the most important works in computational mathematics. The topics range from classical numerical analysis to modern subjects in artificial intelligence and can be adapted to the students. Another objective is to promote collaboration between PhD students through joint work.

### **Course content**

- 1) the lecturer selects a list of classical articles based on the students' research interests.
- 2) the number of articles equals to the number of students.
- 3) each article shall be presented by three students. One acts as a “history expert”, presenting the scientific background of the methods and the authors; one acts as “mathematics expert”, presenting the mathematical analysis part; one acts as “implementation expert”, who shall numerically test the methods introduced in the article and present the results. The three students shall work together to understand the article and prepare the presentations. After that, the lecturer shall make a summary of the article and lead a discussion.
- 4) each student should act as a “history expert” for one article, a “mathematics expert” for another article and an “implementation expert” for a third article. (This cycle may be repeated, in case the number of participants is small). This shall be arranged by the lecturer at the beginning of the course.

### **Form of instruction**

Seminars

### **Examination mode**

Oral presentation and/or written report

### **Literature**

A list of classical articles provided by the lecturer