Are you interested in how to do research on how students learn? The Centre for Discipline-Based Education Research in Mathematics, Engineering, Science and Technology (MINT) invites you to the course

**Quantitative Methods in STEM Education Research:**
**Statistical Methods and Project Design**

**For whom?** Faculty members, researchers and PhD students in all subject areas at TekNat

**When?** Classes will be held in two blocks: 10-14 September and 5-14 November, with a total of eight theory and eight practical classes. See the preliminary schedule on the next page.

**Course content?**

This course aims to provide a comprehensive overview of relevant quantitative methods and their application to STEM (Science, Technology, Engineering and Mathematics) education research, as well as how quantitative studies can be designed and carried out. The course will be both theoretical and practical in nature. Using data sets taken from STEM disciplines, participants will perform quantitative data analysis and reporting using the statistical software package SPSS (license provided during the course).

After completing the course, participants will be able to:

- discuss principles behind the design and application of education research that is quantitative in nature
- perform quantitative data collection and preparation, including descriptive and inferential statistics
- select appropriate statistical techniques for a given problem
- apply, interpret and report the results of statistical tests.


It is possible to apply for the course even if you cannot attend to every lecture and lab.

For more information, contact Anna Eckerdal (Anna.Eckerdal@it.uu.se)
### Course outline and preliminary schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
<th>Lab and Exercises</th>
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| 10 Sept | 10:15 – 12.00 
Introduction to quantitative methods in STEM education          |                                                                                   |
| 12 Sept | 10:15 – 12:00 
Components and design of quantitative research projects            | 13:15 -15.00 
Design of research questions and surveys 
Introduction to SPSS                                                                 |
|         | 10:15 – 12.00 
Data preparation and descriptive statistics                          | 13:15 – 15.00 
Discussion of survey design 
SPSS exercises on data handling, data transformation and descriptive statistics |
| 14 Sept | 10:15 – 12:00 
Inferential statistics                                                |                                                                                   |
| 5 Nov   | 10:15 – 12:00 
Parametric analyses and reporting                                      | 13:15 – 15:00 
Parameteric tests (t-tests and ANOVA)                                             |
| 7 Nov   | 10:15 – 12:00 
Non-parametric analyses and reporting                                    | 13:15 – 15:00 
Non-parameteric tests                                                            |
| 9 Nov   | 10:15 – 12:00 
Grouping variables or subjects                                          | 13:15 – 15:00 
Clustering and factor analysis                                                   |
| 12 Nov  | 10:15 – 12:00 
Correlation and regression analyses and reporting                     | 13:15 – 15:00 
Correlation and regression.                                                        |