

***Epistemological Aspects of Scientific Knowledge  
Production***

<i>Model type:</i>	Compulsory elective module
<i>Module Number:</i>	522120000
<i>ECT credits:</i>	10 total
<i>Hours per week:</i>	4 hrs.
<i>Semester:</i>	5 <sup>th</sup> semester
<i>Frequency:</i>	Begins every fall semester
<i>Length:</i>	1 semester
<i>Attendance time:</i>	60 hrs.
<i>Self-Study:</i>	240 hrs.
<i>Total Workload:</i>	300 hrs.
<i>Qualification goal:</i>	The students understand that physics is a human endeavour which is not a fixed set of knowledge but a cultural activity with specific outcomes that shape and are shaped by society. In this respect, they also understand how physics and the respective knowledge production were developed in a European context and that they are part of European culture. Moreover, they understand central aspects of materiality in the process of research and laboratory practices, but also sociological aspects in knowledge production.
<i>Course content:</i>	The students develop an understanding of how scientific concepts and scientific methods were developed historically. They are able to identify internal and external factors that shaped, triggered or obstructed these developments and can identify central periods of scientific development. The students can use different methods for understanding, criticising, and reflecting on texts by scientists as well as by science historians. They can analyse procedures in order to compare cerebral knowledge and non-cerebral knowledge (skills, tacit knowing) as well as their role in scientific knowledge production. They can also discuss material aspects with respect to the production of scientific knowledge and are able to discuss scientific instrumentation with respect to aspects of materiality.
<i>Methodological competence:</i>	The students can analyse primary and secondary source texts as well as material objects that are related to

conceptual and methodological developments. They can develop practical procedures based on textual and material sources and reflect on this process. They reflect practical experiences with reconstructed instruments in order to develop an understanding of performative and material aspects of knowledge production. They are able to value conceptual understandings that are historical and transfer their understanding to contemporary discussions about social issues related to scientific developments.

*Social and personal competence:*

The students can collaborate in order to perform procedures based on their interpretation of the published account. They can analyse and discuss material aspects of instruments based both on objects and written accounts. The students can place their understanding in the respective historical contexts, reflect on their interpretation and on those of others. They are able to reflect on different procedures of producing a consensus and on epistemological aspects of knowledge production in different historical situations. In this respect, they are able to identify criteria that are historically relevant and put them in relation to their modern understanding of knowledge production.

*Teaching methods:*

Lecture, seminar, laboratory

*Module Coordinator:*

Peter Heering

*Applicability of the Module:*

B.A. Educational Sciences

*Notes:*

This module is taken by students of physics (= subject A) whose second subject is chemistry (= subject B). subject is chemistry (= subject B). The module takes place (at least partly) in English.

**Please note that only the module component “Science as Culture” is available to exchange students, see below for more information on this module.**

## Module Components\*

### ***Module Component 1- Science as Culture***

<b>Module number:</b>	522121000	<b>Learning method:</b>	Seminar
<b>Hours per week</b>	2 hrs	<b>Attendance time:</b>	30 hrs
<b>Type of module:</b>	Mandatory	<b>Self-study:</b>	60 hrs
<b>Planned Group Size:</b>	40	<b>Total workload:</b>	90 hrs

### ***Module Component 2- Materiality in the History of Physics***

<b>Module number:</b>	522122000	<b>Learning method:</b>	Seminar
<b>Hours per week</b>	2 hrs	<b>Attendance time:</b>	30 hrs
<b>Type of module:</b>	Mandatory	<b>Self-study:</b>	30 hrs
<b>Planned Group Size:</b>	12	<b>Total workload:</b>	60 hrs

### ***Exam***

<b>Module number:</b>	522125000	<b>Notes</b>	<b><i>Length of the essay: 18,000 to 25,000 characters</i></b>
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<b>Type of examination:</b>	Essay	<b>Exam preparation:</b>	120 hrs
<b>Graded examination:</b>	yes	<b>Exam Length:</b>	-