

IMAGES OF SCIENCE IN SCIENCE TEACHING FOR ALL STUDENTS (MASTED-01-02)				
<b>DEGREE PROGRAM:</b>		Master in integrated STEAM Education (MASTED)		
<b>SEMESTER:</b> First	<b>TYPE:</b> Basic	<b>CREDITS:</b> 3 ECTS	<b>WORKLOAD:</b> 75 hours	<b>MENTORING:</b> 2 hours/week
<b>LANGUAGE:</b> English				

OBJECTIVES	
<b>General</b>	To develop knowledge of aspects of science in science teaching and learning in relation to education for all students.
<b>Specific</b>	-
SUBJECT MATTER	
During the module, students will encounter and develop knowledge of aspects and images of science in relation to science teaching, with a specific focus on: principles and big ideas in science; nature of science; stereotypes of science teaching, science, and scientists; gender; literary texts; inclusion and social justice.	
COMPETENCES	
<ul style="list-style-type: none"> <li>• C4: Developing and using of a wide range of strategies to organise the classroom/learning space and foster learning</li> <li>• C6: Developing the ability to pay attention to diversity and equality so as to favour the inclusion of all students</li> </ul>	
LEARNING OUTCOMES	
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• Knowledge of: principles and big ideas in science; nature of science; stereotypes of science teaching, science, and scientists; gender; literary texts; inclusion and social justice in relation to science teaching for all students.</li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Ability to analyse textbooks and curricula from the perspective of the course content.</li> </ul>
<b>Attitudes/values</b>	<ul style="list-style-type: none"> <li>• Evaluation of how images of science can affect the inclusion of all students.</li> </ul>
TEACHING METHODS	
The module incorporates seminars and workshops on the analysis of textbooks related to the relevant national curriculum.	
EVALUATION	
Peer feedback on group work, and an individual written assignment. The following grades are used: Excellent (A), Very good (B), Good (C), Satisfactory (D), Sufficient (E), and Insufficient (F).	
PRECONDITIONS	
None	
<b>DEPARTMENT</b>	Department of Mathematics and Science Education
<b>LECTURERS</b>	Anders Jönsson Lotta Leden Andreas Redfors
<b>LITERATURE</b>	<ul style="list-style-type: none"> <li>• Adúriz-Bravo, A., Pujalte, A.P. (2020). Social Images of Science and of Scientists, and the Imperative of Science Education for All. I In H. A. Yacoubian &amp; L. Hansson (Eds.), <i>Nature of Science for Social Justice</i>. pp. 201-224. Springer.</li> <li>• Carlone, H. B., Johnson, A., &amp; Scott, C. M. (2015). Agency amidst formidable structures: How girls perform gender in science class. <i>Journal of Research in Science Teaching</i>, 52(4), 474-488.</li> <li>• Carlone, H. B., Webb, A. W., Archer, L., &amp; Taylor, M. (2015). What kind of boy does science? A critical perspective on the science trajectories of four scientifically talented boys. <i>Science Education</i>, 99(3), 438-464.</li> </ul>

- Comarú, M. W., Lopes, R. M., Braga, L. A. M., Batista Mota, F., & Galvão, C. (2021). A bibliometric and descriptive analysis of inclusive education in science education. *Studies in Science Education*, 57(2), 241-263.
- Feinstein, N. W., Allen, S., & Jenkins, E. (2013). Outside the pipeline: Reimagining science education for nonscientists. *Science*, 340(6130), 314-317.
- Fridberg, M., Jonsson, A., Redfors, A., & Thulin, S. (2020). The role of intermediary objects of learning in early years chemistry and physics. *Early Childhood Education Journal*, 48(5), 585-595.
- Hansson, L., Leden, L., & Thulin, S. (2021). Nature of science in early years science teaching. *European Early Childhood Education Research Journal*, 29(5), 795-807.
- Hansson, L. & Leden, L. (2020). Images of Scientists in Textbooks Aimed at Students in Need of Supplemental Support – An Analysis of Adjustments. In H. A. Yacoubian & L. Hansson (Eds.), *Nature of Science for Social Justice*. pp. 225-243. Springer.
- Hansson, L & Yacoubian (2020). Nature of science for social justice: Why, What and How? In H. A. Yacoubian & L. Hansson (Eds.), *Nature of Science for Social Justice*. pp. 1-21. Springer.
- Harlen, Wynne (2010), Principles and Big Ideas in Science Education. London: The Association for Science Education (ASE) (60 p).
- Hodson, D. (2013). Don't be nervous, don't be flustered, don't be scared. Be prepared. *Canadian Journal of Science, Mathematics and Technology Education*, 13, 313-331.
- Kolstø, S. D. (2020). Teaching Robust Argumentation Informed by the Nature of Science to Support Social Justice. Experiences from Two Projects in Lower Secondary Schools in Norway. In H. A. Yacoubian & L. Hansson (Eds.), *Nature of Science for Social Justice*. pp. 177-199. Springer.
- Leden, L., Hansson, L., & Thulin, S. (2022). Characteristics of book talks about nature of science. *Science Education*. 106(6), 1469-1500.
- Sheth, M. J. (2019). Grappling with racism as foundational practice of science teaching. *Science Education*, 103(1), 37-60.

Research articles focusing individual students background and interests selected jointly by student and teachers of the module can complement the list above.