

## Course Description

### MEDD6469 Trends and Issues of Science Education

Course description		
This course looks at major trends and issues in science education with particular reference to the following issues: gender, sociocultural perspective, language issues (teaching science to second language learners, language across the curriculum), nature of talk through different theoretical perspectives (between teacher and students, between students and students), learning progression of key scientific ideas at different levels of study, attitude towards science and school science, transition between primary and secondary school science (in terms of, e.g. language and conceptual demands). It also examines the role of mobile digital technology in shaping the goals and means of developing science instructions and building learning environments.		
Course objectives		
The course aims to provide students with foundation to their understanding of trends and issues in science education through: <ul style="list-style-type: none"><li>• Identification of major trends and contemporary issues in science education</li><li>• Review of the state of knowledge about contemporary issues and trends in science education</li><li>• Exploration of key areas of research on the related issues</li></ul>		
Course learning outcomes		Aligned programme learning outcomes (PLOs)
1. Identify trends and issues in science education		PLO 1
2. Explore, understand and communicate the concepts and theories underpinning the issues		PLOs 1, 2, 3
3. Make recommendations for practice and policy as well as research in the areas of concern		PLOs 1-5
Course assessment methods		
Assessment method	Weighting (%)	Aligned course learning outcome(s)
Group Presentation	30	CLOs 1-3
Literature Review/Reflective Essay	50	CLOs 1-3
Moodle tasks	20	CLOs 1-3
Course content and topics		
Socio-cultural views of science learning Attitude towards science/school science Primary-secondary transfer in science Medium of Instruction (MOI) in science education and Language across the Curriculum (LAC) Critical evaluation of socioscientific issues (SSI) in the media by applying nature of science (NOS) knowledge and media literacy (ML) concepts (I) STEM education		
Required / recommended readings and online materials		
Anderson, C.W. (2007). Perspectives on science learning, in: S.K. Abell & N.G. Lederman (Ed.) <i>Handbook of Research on Science Education</i> . (New Jersey, Lawrence Erlbaum), 3-30. Hodson, D. & Hodson, J. (1998). From constructivism to social constructivism: a Vygotskian perspective on teaching and learning science. <i>School Science Review</i> , 79(289), 33-41. Leach, J. & Scott, P. (2003). Individual and sociocultural views of learning in science education. <i>Science &amp; Education</i> , 12(1), 91-113. Bennett, J. & Hogarth, S. (2009) Would you want to talk to a scientist at a party? High school students’ attitudes to		

<p>school science and science. <i>International Journal of Science Education</i>, 31(14), 1975-1988.</p> <p># DeWitt, J., Osborne, J., Archer, L., Dillon, J., Willis, B., &amp; Wong, B. (2013). Young children's aspirations in science: The unequivocal, the uncertain and the unthinkable. <i>International Journal of Science Education</i>, 35(6), 1037-1063.</p> <p>Osborne, J., Simon, S. &amp; Collins, S. (2003) Attitudes towards science: A review of the literature and its implications. <i>International Journal of Science Education</i>, 25(9), 1049-1079.</p> <p>Braund, M. (2008). <i>Starting Science ...Again? Making progress in science learning</i>. London: Sage.</p> <p>Logan, M., &amp; Skamp, K. (2012). The Impact of Teachers and Their Science Teaching on Students' 'Science Interest': A four-year study. <i>International Journal of Science Education</i>, DOI:10.1080/09500693.2012.667167</p> <p>Fung, D.C.L., &amp; Yip, W.Y. (2014). The effects of the medium of instruction in certificate-level physics on achievement and motivation to learn. <i>Journal of Research in Science Teaching</i>, 51(10), 1219-1245</p> <p>#Lucas, T., Villegas, A.M. &amp; Freedson-Gonzalez, M. (2008). Linguistically responsive teacher education: Preparing classroom teachers to teach English language learners. <i>Journal of Teacher Education</i>, 59(4), 361-373.</p> <p>Wellington, J.J. and Osborne, J. (2001) <i>Language and Literacy in Science Education</i>. Buckingham: Open University Press.</p> <p>Ryder, J. (2001). Identifying science understanding for functional scientific literacy. <i>Studies in Science Education</i>, 36(1), 1-44.</p> <p>Kellner, D., &amp; Share, J. (2005). Toward critical media literacy: Core concepts, debates, organizations, and policy. <i>Discourse: Studies in the Cultural Politics of Education</i>, 26(3), 369-386.</p> <p># Zeidler, D. L., Sadler, T. D., Simmons, M. L., &amp; Howes, E. V. (2005). Beyond STS: A Research-Based Framework for Socioscientific Issues in Education. <i>Science Education</i>, 89(3), 357-377.</p> <p># Kolstø, S. D. (2001). Scientific literacy for citizenship: Tools for dealing with the science dimension of controversial socioscientific issues. <i>Science Education</i>, 85(3), 291-310.</p> <p>Kolstø, S. D., Bungum, B., Arnesen, E., Isnes, A., Kristensen, T., Mathiassen, K., Mestad, I., Quale, A., Tonning, A. S. V., &amp; Ulvik, M. (2006). Science students' critical examination of scientific information related to socioscientific issues. <i>Science Education</i>, 90(4), 632-655.</p> <p>McClune, B., &amp; Jarman, R. (2010). Critical reading of science-based news reports: Establishing a knowledge, skills and attitudes framework. <i>International Journal of Science Education</i>, 32(6), 727-752.</p> <p>Oliveras, B., Márquez, C., &amp; Sanmarti, N. (2013). The use of newspaper articles as a tool to develop critical thinking in science classes. <i>International Journal of Science Education</i>, 35(6), 885-905.</p> <p>Kelly, T. R., &amp; Knowles, J. G. (2016). A conceptual framework for integrated STEM education. <i>International Journal of STEM Education</i>, 3(11). 1-11.</p> <p># Nadelson, L. S. &amp; Seifert, A. L. (2013). Perceptions, engagement, and practices of teachers seeking professional development in place-based integrated STEM. <i>Teacher Education &amp; Practice</i>, 26, 242-265.</p> <p>Razzouk, R., &amp; Shute, V. (2012). What is design thinking and why is it important?. <i>Review of Educational Research</i>, 82(3), 330-348.</p> <p>Nadelson, L. S., &amp; Seifert, A. L. (2017). <i>Integrated STEM defined: Contexts, challenges, and the future</i>. 221-223.</p> <p>Sousa, D. A., &amp; Pilecki, T. (2018). <i>From STEM to STEAM: Brain-compatible strategies and lessons that integrate the arts</i>. 2<sup>nd</sup> Ed. Corwin: Thousand Oaks, CA.</p>
<b>Other additional course information</b>
Nil