SCIENCE, HISTORY, CULTURE AND SOCIETY (MASTED-02-06)				
DEGREE PROGRAM:		Master in integrated STEAM Education (MASTED)		
SEMESTER:	**TYPE:**	**CREDITS:**	**WORKLOAD:**	**MENTORING:**
Second	Basic	6 ECTS	150 hours	5 hours/week
LANGUAGE: Portuguese/English friendly				

OBJECTIVES	
General	Understand science as a human endeavour, an integral part of our cultures and societies, which transforms and is transformed by its natural and social contexts.
Specific	• Understand the value of various forms of knowledge about the nature of the physical world produced in diverse socio-historical contexts. • Acknowledge the plurality of methods and the social basis for objectivity in the modern natural sciences. • Understand the roles of the natural sciences in the two world wars and their implications for the development of science. • Reflect on the implications of the Cold War for the natural sciences and science teaching. • Discuss the social, economic, and environmental impacts of science based using studies about the green revolution. • Discuss the complex interplay between science and society and the role of science teaching in the socio-political controversy around Climate Change.

SUBJECT MATTER

- The origins of modern science.
- Chemistry and physics at the dawn of the 20th century and the controversies about the foundations of science.
- Science in world war I and II and its implications for the development of science beyond Europe and North America.
- Science and politics in the 20th century: science in the USA, USSR and Brazil in the period of the military regime.
- Modernization of agriculture in Latin America.

COMPETENCES

- C1: Developing knowledge and understanding of science as an integral part of society.
- C2: Developing advanced cognitive and procedural skills associated with knowledge development and creation.
- C3: Developing of plans and organising and innovating the teaching/learning process, as well as to apply the plan and to assess its application.
- C4: Developing and using of a wide range of strategies to organise the classroom/learning space and foster learning.
- C5: Developing of assess in order to evidence learning and to improve the learning process and the teaching practices.
- C6: Developing the ability to pay attention to diversity and equality so as to favour the inclusion of all students.
- C7: Developing the ability to establish effective relationships with families, to cooperate with colleagues and with other institutions from the community.
- C12: Developing critical literacy competence.

LEARNING OUTCOMES	
Knowledge	• Knowledge of science as a historically and culturally situated social practice.
Skills	• Ability to use the works of the history and philosophy of science to think critically about contemporary issues and the place and role of science and scientists in society. • Ability to explain the basis for trust in science.

	• Ability to explain how the major geopolitical events since WWII have influenced and have been influenced by science and scientists. • Researcher skills development.
Attitudes/values	• Critical thinking about the social, economic, and environmental impacts of science and technology. • Development of epistemological awareness about historical development of science in different contexts. • Development of awareness of the value-laden character of science and technology.
TEACHING METHODS	
The discipline is based on two methodological approaches: • Team-Based Learning - An active learning methodology designed to promote pear-to-pear collaboration that structures the learning process in five phases: (I) pre-class preparation (such as readings and films); (II) readiness assurance tests (RAT) at the start of the class, which tests the comprehension of the preparatory material; (III) mini-lecture focused on the topics the students did not perform well in the RAT; (IV) application activities, in which the students apply their knowledge to real-life situations; and (V) synthesis addressing the learning objectives. • Classroom debates on movies/documentaries and Lectures taken by invited researchers.	
EVALUATION	
• Readiness assurance test (to evaluate pre-class preparation), application activities; synthesis activities, and essays. • Participation in classroom debates.	
PRECONDITIONS	
None	
DEPARTMENT	Institute of Chemistry
LECTURERS	Letícia Pereira Climério Paulo da Silva Neto Amanda Amantes Neiva Olival Freire Júnior
LITERATURE	• Fara, P. (2009). Science: A Four Thousand Year History. OUP Oxford • Friedrich, B., Hoffmann, D., Renn, J., Schmaltz, F., & Wolf, M. (2017). One hundred years of chemical warfare: research, deployment, consequences. Springer Nature. • Lenoir, T. (1997). Instituting science: The cultural production of scientific disciplines. Stanford University Press. • Oreskes, N., & Conway, E. M. (2011). Merchants of doubt: How a handful of scientists obscured the truth on issues from tobacco smoke to global warming. Bloomsbury Publishing USA. • Oreskes, N. Why Trust Science? , 2019. Princeton: Princeton University Press. • Ron, J. S. (1992). El poder de la ciencia. Alianza, Madrid. • Schwartzman, S. (2001). Um espaço para a ciência: a formação da comunidade científica no Brasil. Campinas: Editora Unicamp.