Course Description Form

1/ GENERAL DESCRIPTION

Instructor
Tommaso Venturini

Course title, in the language of instruction
Mapping Controversies in the Energy Sector

Language of instruction
English

Semester
☑   Fall Semester
☑   Spring Semester

Online course
☐   yes
☑   no

Prerequisites
The course extends over 2 semesters, each with its special flavor. In fall, students explore a controversy experimenting a series of qualitative and digital methods of enquiry. In spring, students learn how to represent their controversy in a multimedia environment. Attending the 1st semester is necessary to understand the 2nd (and vice versa).

Type of course
☑   Lecture course with tutorials
☐   Lecture course
☐   Seminar course
☐   Elective
☑   Workshop

Course description
The course teaches the students how to deal with complex techno-scientific issues in the field of energy where experts disagree and outcomes are uncertain.
By investigating the case studies of a specific controversy (of their choice), the students will learn to deploy the imbroglios of science, politics, ethics and technologies characterizing the modern production of energy.
By practicing advance techniques of web cartography, scientometrics and text analysis, students will learn to exploit the traceability of electronic media.
By representing their controversy through the creative use of multimedia formats (such as videos and websites), the students will learn how to contribute to the public debate on energy.
See examples of students' work: http://controverses.sciences-po.fr/archiveindex/

Course requirements (grading & assessment)
Fall intermediary evaluation: controversy choice report
Fall final evaluation: enquiry report

Spring first intermediary evaluation: script
Spring second intermediary evaluation: storyboard
Spring final evaluation: controversy-atlas

Course workload
Exploring and representing techno-scientific controversies is not easy and requires a considerable amount of work. However, this work is made interesting by the possibility to choose one's case study; to work in groups; to experiment a series of cutting-edge digital methods; to publish a multimedia atlas.

Pedagogical format
The course follows a 'learning-by-doing' pedagogy. Its most important task is the analysis of a socio-technical controversy. Achieving this task implies understanding some important concepts of STS (Science and Technology Studies) and mastering a number of traditional and digital research techniques.

The course alternates between lectures and workshops.
- The lectures introduce and discuss theoretical notions and methodological tools.
- The (small groups) workshops assure a constant and personalized support and to provide a space for sharing and working together.

3/ COMPLEMENTARY INFORMATION

Schedule of the course:
- ☑ 12 weeks each semester (24 weeks)
- ☐ 12 weeks
- ☐ 6 weeks
- ☐ other

Approach of the course:
- ☐ rather theoretical
- ☐ rather practical
- ☑ balanced mix

Objective of the course:
The objective of the course is to provide students with a series of conceptual and digital tools to understand and deal with the complexity of modern techno-science, particularly but not exclusively in the energy sector.

Detailed summary of the course – above 800 characters (if needed):
The economic inequities, the environmental crises, the bioethical conundrums and all the issues troubling modern societies are imbroglios of politics, ethics and technologies that are impossible to disentangle. In these hybrid situations, public participation becomes particularly difficult. To navigate a world of uncertainties, future citizens need tools to explore and visualize the complexity of public debate. The purpose of controversy mapping is to invent and teach these tools through the creative use of digital technologies.

Introduced by Bruno Latour more than 15 years ago, the cartography of controversies is currently taught in several European universities (Paris, Copenhagen, Milan, Manchester, Amsterdam, Liège, Padova, Trento…) and American universities (Cambridge Ma., São Paulo, Rio de Janeiro, Buenos Aires…).

Characterized by a radically experimental approach, controversy mapping continues to be developed through several research projects
- MACOSPOL (mapping controversies on science for politics) 2007-09
- MEDEA (mapping environmental debate on adaptation) 2011-14
- EMAPS (electronic maps to assist public science) 2011-14
- FORCCAST (formation à la cartographie des controverses pour l'analyse de sciences et des techniques) 2012-20

4/ BIOGRAPHICAL INFORMATION

Title: Coordinator of the research activities at the Sciences Po médialab

Organisation/Affiliation: Sciences Po médialab

Short biography:

Tommaso Venturini (tommasoventurini.it) is 'professeur associé' and coordinator of the research activities at the Sciences Po médialab.His research activities focus on digital methods, controversy mapping and social modernization. He is leading scientist of the projects EMAPS and MEDEA and responsible for the Axis 1 of the project FORCCAST.

Tommaso Venturini has been trained in sociology and media studies at the University of Bologna, completed a PhD in Society of Information at the University of Milano Bicocca and a post-doc in Sociology of Modernity at the Department of Philosophy and Communication of the University of Bologna. He has been visiting student at UCLA and visiting researcher at the CETCOPRA of Paris 1 Pantheon Sorbonne. During his studies he has founded a web design agency and worked in several online communication projects.

5/ COURSE OUTLINE

Short version

Fall semester

Session 1(i) lesson – WHY controversies? Learning to be constructivist
Session 2(i) workshop – WHY controversies? Choosing a controversy and understanding its potential

Session 3(i) lesson – WHO fights controversies? The heterogeneity of technoscientific networks
Session 4(i) workshop – WHO fights controversies? Identifying the actor-networks of your controversy

Session 5(i) lesson – WHAT's in a controversy? Deviation and composition of actions and identities
Session 6(i) workshop – WHAT's in a controversy? Establishing research questions and inquiry design

– *Fall intermediary evaluation: controversy choice report (5 points)*

Session 7(i) lesson – HOW to quantify controversies? Following actions and traces
Session 8(i) workshop – HOW to quantify controversies? Mining corpora

Session 9(i) lesson – HOW to quantify controversies? Tables, charts and networks
Session 10(i) workshop – HOW to quantify controversies? Building tables, charts and networks

Session 11(i) lesson – WHERE are the actor-networks? From networks to spheres
Session 12(i) workshop – WHERE are the actor-networks? Analyzing network visually

– *Fall final evaluation: enquiry report (5 points)*

Spring semester

Session 1(ii) lesson – WHY controversies? Contributing to the public debate with narration and exploration
Session 2(ii) workshop – WHY controversies? Defining your goal and scripting how to reach it

Session 3(ii) lesson – HOW to write controversies. The script of your controversy atlas
Session 4(ii) workshop – HOW to write controversies. Writing the script of your controversy atlas

– *Spring first intermediary evaluation: script (3 points)*

Session 5(ii) lesson – WHAT is in a controversy? Controversy visualization
Session 6(ii) workshop – WHAT is in a controversy? Quantifying and qualifying what you know

Session 7(ii) lesson – HOW to stage controversies? The storyboard of your controversy atlas
Session 8(ii) workshop – HOW to stage your controversies? Drafting the storyboard of your controversy atlas

– *Spring second intermediary evaluation: storyboard (3 points)*

Session 9(ii) lesson – WHAT lessons have we learned through the journey?

Session 10(ii) workshop – Finalizing the controversy atlas
Session 11(ii) workshop – Finalizing the controversy atlas
Session 12(ii) workshop – Finalizing the controversy atlas

– *Spring final evaluation: controversy atlas (5 points)*

Detailed version

Session 1(i) – fall semester – lesson
WHY controversies? Learning to be constructivist

What we will do:

In this lesson, we will go through the history of science and technologies studies and discuss their progressive movement toward scientific practices and away from positivist theory.
We will also described the so-called "Science Wars" and how actor-network theory learned from them to avoid sociological relativism.
Finally, we will discuss a few examples of good and bad controversy subjects.

What you will learn:

In this lesson, you will learn that scientific truth and technical efficacy are not easily established. In particular, one cannot rely of some external force (be it Nature like in positivism or Society as in relativism) to close the controversies of science and technologies. Scientific and technological objectivity depends on the quantity and quality of the work employed to build them. Controversies are privileged situations to study reveal and explore the sciences and technologies in the making.
You will also learn how to choose a good controversy subject.

Home assignment:

o   Revise the notes of the lesson and reads the excerpts from:
  •   H. Collins (1975). The Seven Sexes: A Study in the Sociology of a Phenomenon. *Sociology*, 9(2): 205-224.
  •   T.P. Hughes (1994), "Technological momentum" in M.R. Smith and L. Marx (ed.) *Does Technology Drive History?: The Dilemma of Technological Determinism*, Cambridge Ma, MIT Press: 101-113.
o   Form groups of 5 students and pre-selects a few (3 or 4) potentially interesting controversy subjects.

Session 2(i) – fall semester – workshop
WHY controversies? Choosing a controversy and understanding its research potential

What we will do:

In this workshop, we will discuss the texts and try to use them to understand the research potential of the proposed controversy subjects.

What you will learn:

In this workshop, you will learn that truth and efficacy do not decide technoscientific controversies but are decided by them.
You will also choose your controversy subject and begin to reflect on its research potential (= what story does it tell and what can be learnt from it).

Home assignment:

o   (In group) write down a short description of the controversy you have chosen and the reasons why you find it interesting.

Session 3(i) – fall semester – lesson
WHO fights controversies? The heterogeneity of technoscientific networks

What we will do:

In this lesson, (after a short summary of the previous unit by a randomly chosen student) we will examine the notion of generalized symmetry (sciences and technologies are social constructions, society is a techno-scientific construction) as a way out of relativism.
We will then introduce two case studies, the first about HIV research and the second about Thomas Morgan and drosophila genetics.
After that, we will stage a little collective exercise in identification of actors.
Finally, a detailed description of the course development will be provided.

What you will learn:

In this lesson, you will learn how technoscientific objectivity is established (and controversies won) by building a coherent and extended network of allies within and beyond the walls of the scientific laboratory.

You will also learn to acknowledge the role of two crucial type of actors: the non-human actors and the scientists and engineers.

Home assignment:

o Revise the notes of the lesson and reads the excerpts from:
- Winner, L. (1980). Do Artifacts Have Politics? *Daedalus*, 109(1): 121-136.
- Wynne, B. (1992). Misunderstood misunderstanding: social identities and public uptake of science. *Public Understanding of Science*, 1, 281–304.

Session 4(i) – fall semester – workshop
WHO fights controversies? Identifying the actor-networks of your controversy

What we will do:

In this workshop, we will draw on the texts to identify the actors-networks present in the controversy chosen by each group.

What you will learn:

In this workshop, you will learn how to identify the actors-networks of a controversy and you will understand the importance of "following the actors".

Home assignment:

o (In group) write down the list of the main actors-networks of your controversy.

Session 5(i) – fall semester – lesson
WHAT's in a controversy? Deviation and composition of actions and identities

What we will do:

In this lesson, (after a short summary of the previous unit by a randomly chosen student) we will introduce the case study of Pasteur's controversies on microbiology.
We will then stage a little collective exercise in recognition of deviations and compositions.
After that, will examine the construction of black boxes in science and technology though the case studies of the Pedofil of Boavista and of the Columbia shuttle. We will also discuss the role of controversies as black-boxes openers.
Finally, we will discuss some examples of good and bad research questions.

What you will learn:

In this lesson, you will learn that the heterogeneous networks of science and technology are built by deviating and composing actions and identities and that their objectivity depends on the quantity and quality of the work employed to build them.
You will also understand how and why this work of construction is hidden in the case of most scientific theories and technical objects and therefore appreciate the value of controversies as a methodological expedient.
You will also understand the importance of a clear identification of the research questions and their operationalization.

Home assignment:

o Revise the notes of the lesson and reads the excerpts from:
- Latour, B (1995). "Joliot: History and Physics Mixed Together" in Serres, M. (ed) *History of Scientific Thought*, London, Blackwell , pp. 611-635.
- Mitchell, T. (2009). Carbon democracy. *Economy and Society*, 38(3), 399-432.

Session 6(i) – fall semester – workshop
WHAT's in a controversy? Establishing research questions and inquiry design

What we will do:

In this workshop, we will draw on the texts to establish a short-list of research questions and design their operationalization.
We will also introduce the actors-issues table as an analytic way to store information on your controversy.

What you will learn:

In this workshop, you will learn to identify the most interesting articulations of the actor-networks within your controversy and to note them down in an actors-issues table.

Home assignment:

o (In group) prepare the your controversy choice report.

Fall intermediary evaluation: controversy choice report (5 points)

Each group submits before session 7(i) a report containing:
- a description the controversy it has chosen (max 1 page);
- a discussion of its research potential (max 1 page);
- a description of the most important actors-networks within the controversy (max 2 pages);
- the envisioned research-questions and their operationalization (max 1 page);
- a preliminary calendar of the enquiry (max 1 page);
- a preliminary bibliography and sitography.

Grading criteria
1. Description of the controversy and its interest
2. Preliminary list of actors-networks and issues
3. Research-questions, operationalization and plan of enquiry
4. Bibliography and sitography
5. STS notions mobilized

Session 7(i) – fall semester – lesson
HOW to quantify controversies? Following actions and traces

What we will do:

In this lesson, (after a short summary of the previous unit by a randomly chosen student) we will reflect on the limits of qualitative and quantitative methods of investigation in social sciences.
We will then introduce digital methods and reflect the transition of social sciences from "micro/macro" to "actor-network".
We will then leave for a guided tour through a few online data repositories and we will examine a few examples of how to build a corpus through querying and filtering.

What you will learn:

In this lesson, you will be introduced to the world of digital traces. You will discover different types of digital data (scientific literature, web, texts, statistical data) and explore a few repositories available online. You will learn to collect and, more importantly, how to clean a digital corpus.

Home assignment:

o (In group) identify one or more exploitable datasets and define a series of queries and filters.

Session 8(i) – fall semester – workshop
HOW to quantify controversies? Mining corpora

What we will do:

Helped by the médialab team, we will extract and clean one or more corpora of digital traces.

What you will learn:

In this workshop, you will learn to extract and clean corpora (=datasets) from various repositories of digital traces.

Home assignment:

o (In group) extract one or more corpora on its controversies.
o Watch the video-tutorial on data handling in a spreadsheet and in Google Refine.
o Watch the video-tutorial on data visualizing in Raw.

Session 9(i) – fall semester – lesson
HOW to quantify controversies? Tables, charts and networks

What we will do:

In this lesson, (after a short summary of the previous unit by a randomly chosen student) we will examine together an example of data manipulation in a spreadsheet and in Google Refine.
We will then discuss a few examples of bad and good data visualizations.
After having discussed the visual variables introduced by Jacques Bertin, we will play a little collective exercise of data visualization.
Finally we will examine an example of network extraction in Table2Net.

What you will learn:

In this lesson, you will learn what a data table is and how it can be manipulated.
You will also learn which visual variable should be employed on which type of data and for which objective.

Home assignment:

o   (In group) reviews your research questions to understand which tables and charts could answer them.
o   Watches the video-tutorial on network extraction in Table2net.

Session 10(i) – fall semester – workshop
HOW to quantify controversies? Building tables, charts and networks

What we will do:

In this workshop, with the help of the médialab team, we will extract tables, charts and networks from the collected corpora.

What you will learn:

In this workshop, you will learn to manipulate a variety of digital data through a variety of different techniques.

Home assignment:

o   (In group) select the best charts that you produced and write a short description of each of them.
o   (In group) extract one or more networks from your corpora.

Session 11(i) – fall semester – lesson
WHERE are the actor-networks? From networks to spheres

What we will do:

In this lesson, (after a short summary of the previous unit by a randomly chosen student) we will discuss the compatibility of actor-network theory and complex network analysis. In particular:
- Starting from Jacob Moreno's sociograms, we will introduce the technique of force-vector spatialization and we will learn to read networks as maps.
- Retracing the history of the discovery of complex networks and reflecting on the art works by Tomás Saraceno, we will discuss the notions of 'connection', 'frontier' and 'level'.
This complete example of visual network analysis will be provided.
We will also initiate the work that will occupy the spring semester, by introducing the 5 questions of the communication strategy.

What you will learn:

In this lesson, you will learn that collective networks are flat but not homogeneous and that distinctions such nature/culture, science/politics, moral/technology are not explanations but *explananda.* Hopefully, this will make you sensible to differences in connectivity.
You will learn how to write a coherent communication strategy.

Home assignment:

o   (In group) write down an analysis (in actor-network style) of the spheres of your controversy.
o   (In group) watch the video tutorial on visual network analysis.

Session 12(i) – fall semester – workshop
WHERE are the actor-networks? Analyzing network visually

What we will do:

In this workshop, we will perform the visual network analysis of the networks extracted in the previous sessions.

What you will learn:

In this workshop, you will learn to analyze a network visually.

Home assignment:

o   (In group) prepare your enquiry report.

Fall final evaluation: enquiry report (5 points)

Each group submits a report containing:
- the tentative communication strategy of your controversy atlas (max 2 page);
- the actor-issue table of its controversy;
- the interpretation and possible usage of the maps (chart and networks);
- a revised calendar of the enquiry (max 1 page);
- a revised bibliography and sitography.

The report is also orally presented to the team of the course and discussed with it.

Grading criteria
1. Intention and communication strategy
2. Actor-issues table
3. Maps: interpretation and usage
4. Plan of enquiry
5. STS notions mobilized

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Session 1(ii) – spring semester – lesson
WHY controversies? Contributing to the public debate with narration and exploration

What we will do:

In this lesson, drawing on the pragmatist definition of public (in particular Lippmann's and Dewey's), we will discuss how technoscientific questions become issues of public concern and how controversy mapping can contribute to facilitate public debate around them.
We will also discuss the difference (and the tension) between narration and exploration and introduce the difference between script and storyboard (and how both derive from the chosen communication strategy).

What you will learn:

In this lesson, you will understand the potential political role of controversy mapping and you will learn how to improve your communication strategy.

Home assignment:

o   Revise the notes of the lesson and reads the excerpts from:
   •   Lippmann, W. (1927). *The Phantom Public*. The Macmillan Company.
   •   Latour, B. (2012). "Que la bataille se livre au moins à armes égales". In Decroly J., M, Gemenne F., Zaccai E. (eds). *Controverses climatiques, sciences et politique*. Paris: Presses de Sciences Po.
o   (In group) amend your communication strategy.

Session 2(ii) – spring semester – workshop
WHY controversies? Defining your goal and scripting how to reach it

What we will do:

In this workshop, we will draw on the texts to identify what is the political intention of your controversy atlas and who is its public. We will then reflect on the consequences that this has on the communication strategy and on the finalization of the enquiry.

What you will learn:

In this workshop, you will learn how to improve your communication strategy and in particular identify why and for whom you are developing your atlas.

Home assignment:
- ○ (In group) amend your communication strategy.
- ○ (In group) write a detailed description of your *fil rouge* (pitch)
- ○ Watch the video-tutorial on script writing.

Session 3(ii) – spring semester – lesson
HOW to write controversies. The script of your controversy atlas

What we will do:

In this lesson, (after a short summary of the previous unit by a randomly chosen student) we will discuss the importance of the script and we will introduce the techniques of script writing.
We will then examine a case study of a controversy atlas from the controversy archive. We will make its script explicit and we will discuss on how it could be improved.

What you will learn:

In this lesson, you will learn why and how to write the script of your controversy atlas.

Home assignment:
- ○ (In group) write a draft of the script of your controversy atlas.

Session 4(ii) – spring semester – workshop
HOW to write controversies. Writing the script of your controversy atlas

What we will do:

In this workshop, we will work together on the definition of the script of the controversy atlas, considering the communication strategy of the atlas and the items of information collected in the enquiry.

What you will learn:

In this workshop, you will improve your skills in script writing.

Home assignment:
- ○ (In group) finalize the script of your controversy atlas.

Spring first intermediary evaluation: script (3 points)

Each group submits a document containing:
- the definitive communication strategy of your controversy atlas (max 2 page);
- the description of the fil-rouge (pitch) (max 5 lines);
- the script (max 2 pages)

Grading criteria
1. Communication strategy
2. Fil-rouge (pitch)
3. Script

Session 5(ii) – spring semester – lesson
WHAT is in a controversy? Controversy visualization

What we will do:

In this lesson, we will consider how to embed the results of your enquiry (interviews, video and audio recording, charts, networks…) in your controversy atlas.
We will therefore describe the different devices of controversy visualization, by discussing a series of good and bad examples from the controversy archive.

What you will learn:

In this lesson, you will learn to draw a series of visual devices to represent your controversy.

Home assignment:
o   (In group) sketch one or more visualizations.

Session 6(ii) – spring semester – workshop
WHAT is in a controversy? Quantifying and qualifying what you know

What we will do:
In this workshop, we will examine together the sketches of the visualizations realized as home assignment.

What you will learn:
In this workshop, you will learn how to render visually what you have learned about your controversy. You will also have a chance to reflect on the weaknesses of your enquiry and to understand how to overcome them.

Home assignment:
o   (In group) correct and develop your visualizations.
o   Watch the video-tutorial on storyboard writing.

Session 7(ii) – spring semester – lesson
HOW to stage controversies? The storyboard of your controversy atlas

What we will do:
In this lesson, we will introduce some techniques of storyboard writing and we will consider how the script content can be differently implemented in two different media: the video and the web.
To do so, we will consider the example of the script discussed in the previous lessons and we will try to translate it in the cinematographic and web language.

What you will learn:
In this lesson, you will learn how to move from the script to the storyboard.

Home assignment:
o   (In group) gather the raw materials that you will use for the video or the website.
o   (In group) write a draft of the storyboard of your controversy atlas.

Session 8(ii) – spring semester – workshop
HOW to stage your controversies? Drafting the storyboard of your controversy atlas

What we will do:
In this workshop, we will discuss the storyboards of the controversy atlases by taking into consideration three questions: 1) is the storyboard coherent with the script? 2) does the storyboard respect the specificity of the chosen media? 3) is the storyboard feasible given the material collected in the enquiry?

What you will learn:
In this workshop, you will improve your skills of storyboard writing.

Home assignment:
o   (In group) finalize your storyboard.

Spring second intermediary evaluation: storyboard (3 points)

Each group submits the storyboard of its controversy atlas.

Grading criteria
1. Consistency between the script and the storyboard
2. Adaptation to the media
3. Feasibility

Session 9(ii) – spring semester – lesson
WHAT lessons have we learned through the journey?

What we will do:

In this lesson, we will take stock of the controversy-mapping course, discussing the problems encountered and how they could have been avoided.

What you will learn:

In this workshop, you will learn how to employ the conceptual and technical tools introduced in the controversy mapping course in your future professional career.

Home assignment:

o   (In group) work on your controversy atlas.

Session 10(ii) – spring semester – workshop
Finalizing the controversy atlas

What we will do:

In this workshop, with the help of the médialab team, we will work in group to finalize the controversy atlas

Home assignment:

o   (In group) work on your controversy atlas.

Session 11(ii) – spring semester – workshop
Finalizing the controversy atlas

What we will do:

In this workshop, with the help of the médialab team, we will work in group to finalize the controversy atlas

Home assignment:

o   (In group) work on your controversy atlas.

Session 12(ii) – spring semester – workshop
Finalizing the controversy atlas

What we will do:

In this workshop, with the help of the médialab team, we will work in group to finalize the controversy atlas

Home assignment:

o   (In group) Finalize on your controversy atlas.

Spring final evaluation: controversy atlas (5 points)

Each group submits and presents its controversy atlas to the jury (the atlases will be submitted in the final form two days before the presentation of the final exam).

Grading criteria
1. Quality of the traditional and digital enquiry (thickness of the description)
    2. Interest and legibility of the narration
    3. Availability of documentation (explorability)
    4. Technical quality of the atlas
    5. Bonus: risk taking