PSTS Programme 2013-2014

PSTS 2013-2014 First Year

Schedule 1st Year

Term 1		***Term 2***	
Block 1A	***Block 1B***	***Block 2A***	***Block 2B***
Philosophy of Technology (201200063) 5 EC	TechnoLab (201200058) 10 EC		Technology and Social Order (191622510) 5 EC
Science and Technology Studies (201200064) 5 EC	Philosophy and History of Science and Technology (201200061) 5 EC	Philosophical Anthropology and Technology (191612550) 5 EC	Ethics and Technology II (191612580) 5 EC
Philosophical Theories and Methods (201200059) 5 EC	Ethics and Technology I (191612540) 5 EC	Society, Politics and Technology (191612560) 5 EC	PhiloLab (201200062) 5 EC

Course Descriptions 1st Year

Philosophy of Technology

Course name	Philosophy of Technology			**Course code**	201200063
Participating programme	PSTS			**Phase/ Study period**	M1,1A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Prior knowledge for	All other PSTS courses				
Teaching staff	Prof. dr. Ir. P.P.C.C. Verbeek (coordinator, teacher and first assessor), Dr. P. Vermaas (teacher and co-assessor),				
Study material	Verbeek, P.P. (2005). *What Things Do - Philosophical Reflections on Technology, Agency, and Design*. University Park, PA: Penn State University Press. Vermaas, P., P. Kroes, I. van de Poel, M. Franssen and W. Houkes (2011) *A Philosophy of Technology: From Technical Artefacts to Sociotechnical Systems*, vol. 6 of *Synthesis Lectures on Engineers, Technology and Society* (Morgan & Claypool). Further study materials include scientific articles and PPT slides.				
Subjects, theories and models	In this course, students get an introduction into the philosophy of technology, both historically and thematically. Attention will be paid to the emergence of the philosophy of technology as an independent field of philosophical inquiry and the (social) problems that are central in this field. The main philosophers, developments and currents in the philosophy of technology will be dealt with. Apart from such a historical introduction, important themes in the philosophy of technology, like technological determinism, the nature of technological knowledge, the normative dimensions of technology, internalism versus externalism will be discussed. A number of these themes will be further elaborated in courses in the second term of the first year, like social and political philosophy, epistemology, ethics and technology and philosophical anthropology. The core theories are phenomenology and postphenomenology, mediation theory and analytic philosophy.				
Teaching methods	During 8 lectures of 4 hours the theories are discussed. Beside these lectures there are 6 Academic Skills workshops of 4 hours. The course is divided in a continental part, organized by the Department of Philosophy, University of Twente, and an analytic part organized by the Department of Philosophy, Delft University of Technology.				
Examination and assessment	The assessment is based on a written examination and a paper assignment (both 50% of the mark). The written examination has open questions and takes 3,5 hours.				
Learning objectives	This course connects to the final qualifications K1, K2, K4, K5, S1, S2, S3, of the programme, according to the following eleven learning objectives: At the end of the course the student has knowledge of or insight in: 1. classical philosophy of technology. 2. contemporary continental approaches within the philosophy of technology. 3. analytic approaches within the philosophy of technology 4. the intentional-structural distinction in analytic philosophy. 5. preliminary characterizations of designing. At the end of the course the student is able to: 6. characterize the various approaches in the philosophy of technology, as well as its major divisions (ethics, social				

	philosophy, philosophy of culture, epistemological approaches). 7. describe major topics, theories, developments and approaches in philosophy of technology. 8. analyze a technological development in terms of the basic frameworks in philosophy of technology. 9. discuss the merits and shortcomings of philosophical theories and ideas introduced in the course and to compare and contrast different positions with each other. 10. read and interpret original philosophical texts and to summarize or otherwise communicate the ideas expressed in these texts. At the end of the course the student 11. has basic competence in writing a philosophical paper.

Science and Technology Studies

Course name	Science and Technology Studies			**Course code**	201200064
Participating programme	PSTS			**Phase/ Study period**	M1, 1A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Prior knowledge for	All other PSTS courses				
Teaching staff	Prof.dr. N.E.J. Oudshoorn (coordinator, teacher and first assessor),				
Study material	Sismundo. S. (2009). *An Introduction to Science and Technology Studies*. Malden and Oxford: Blackwell Publishing. (Selection) Further study materials include a syllabus, case material for the SCOT and ANT analysis and PPT slides of the lectures.				
Subjects, theories and models	This course aims to introduce students to the interdisciplinary field of science and technology studies. Students will be introduced to the main theoretical approaches in the field, including the Strong Program; the Social Construction of Technology, Actor Network Theory; and Evolutionary Approaches. Moreover, students will get some hands-on experience with using STS theories and concepts in doing empirical research on recent developments in science, technology and society.				
Teaching methods	During 10 lectures of 2 hours the theories are discussed. Students are actively involved in each class (through student presentations and assignments) and are stimulated to discuss relevant theories critically.				
Examination and assessment	The assessment is based on 2 individual interim assignments (together 60% of the mark), and a final group assignment (40% of the mark).				
Learning objectives	This course connects to the final qualifications K1, K3, K4, S1, S2, S4, S5 and S6 of the programme, according to the following eight learning objectives: At the end of the course the student has knowledge of or insight in: 1. the main theoretical approaches and concepts developed in the Social Studies of Technology and Society. At the end of the course the student is able to: 2. understand specific developments and problems in science and technology from the different theoretical perspectives presented in the course in order to compare and contrast these different approaches and to discuss their advantages and disadvantages. 3. interpret and use theoretical approaches and concepts to understand the dynamics of scientific and technological development. 4. review theoretical and empirical texts.				

	5. present theoretical articles and own research to an informed public (of fellow students and teachers) 6. conduct a critical discussion.At the end of the course the student has experience in: 7. close reading of social scientific literature. 8. setting up, conducting and reporting the outcomes of a limited social science research, including interviews to collect relevant empirical data.

Philosophical Theories and Methods

Course name	Philosophical Theories and Methods			**Course code**	201200059
Participating programme	PSTS			**Phase/ Study period**	M1, 1A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Prior knowledge for	All other PSTS courses				
Teaching staff	Dr. J.H. Søraker, Prof. dr. P.A.E. Brey				
Study material	Will be made available on blackboard.				
Subjects, theories and models	This course introduces students to various methods and approaches within philosophy. The course emphasizes philosophers and methods of doing philosophy that have an important role throughout the master program PSTS, including analytical methods, hermeneutical methods and applied empirical methods. The course will also give a short introduction to formal logic.				
Teaching methods	Lectures and seminars				
Examination and assessment	Written exam + Assignments				
Learning objectives	This course connects to the final qualifications K1, K2, K4, K5, S1, S2 of the programme, according to the following two learning objectives: At the end of the course the student has knowledge of or insight in: 1. central methods and approaches within philosophy. At the end of the course the student is able to: 2. understand, explain and compare philosophical theories and methods				

TechnoLab

Course name	TechnoLab			**Course code**	201200058
Participating programme	PSTS			**Phase/ Study period**	M1, 1B-2A
Credits	10.0	**Language**	English	**Obligatory/ elective**	Obligatory
Requirements for entrance	1. Philosophical Theories and Methods 2. Philosophy of Technology 3. Science and Technology Studies				
Teaching staff	Prof. dr. ir. M. Boon				
Study material	A hand-out that specifies the details of this course. Materials are available on blackboard.				
Subjects, theories and models	In the TechnoLab project students get acquainted with technological developments for which research is performed in (UT) Engineering Sciences and Social Sciences disciplines and research institutions. Students get to understand scientific research practices (i.e. engineering sciences and social sciences) that work towards these technological developments, as well as their social and political contexts and settings. Different approaches will be taken in developing this understanding, such as studying brochures, websites and				

	scientific articles, but also interviews with researchers will be conducted in order to get insight in the content and approaches of their scientific work. Based on the understanding of a technological development that has been gained in the first part of this course, PSTS topics are explored in the second part. This way students are encouraged to apply PSTS topics of PSTS courses in the Technolab project (Philosophy of Technology; Science and Technology Studies; Ethics and Technology I; and History and Philosophy of Science and Technology).
Teaching method	Lectures and seminars (4h per week). The lectures aim at providing topics and materials relevant for the project and for achieving the learning objectives. The seminars will be editorial board meetings in which the progress of the magazine will be discussed. Written and oral feedback on intermediate versions of the magazine will be provided by the teacher and by students of other groups. Starting point is an investigative journalism setting consisting of a heterogeneous team. Students are divided into groups of 3 or 4 students with different backgrounds. Each group chooses a technology that is currently being developed, and the development of which they aim to investigate and write about. Hence, the project of each group is to produce a 'High tech – Human touch' magazine that addresses a technological development of their own choice. This magazine will address the technology and its societal context. It will also explain some of the engineering science research that is being done towards its development. Additionally, it will inform the reader about some of the social science research that investigates related societal issues. Finally, the magazine will present the reader with some interesting outlooks, analyses or philosophical questions regarding the topics that have been described and explained, which makes use of the content and approaches of the four PSTS courses (Philosophy of Technology; Science and Technology Studies; Ethics and Technology I; Philosophy and History of Science and Technology). This project involves at least the following activities: **I. The technology** Students explore relevant technical and scientific research in the Netherlands (via websites of NWO, KNAW, research institutes at UT, etc.). This phase is initiated by 1 or 2 informative classes/seminars that will deal with how scientific research is organized (including its history). Students derive from this explorative phase a topic that they wish to study further. Students make a plan and a preliminary planning for producing the magazine. This plan and planning must be adapted and worked out in further details during the project. **II. The engineering sciences** Students study in more depth existing research programs and the kind of engineering science research that is performed in the context of their technology. Their focus will be on the researcher(s) they aim to interview at a later stage. Students prepare and perform the interview(s). As a preparation they formulate questions that aim to better understand the investigated topics and their practical implications. Also, they anticipate the kinds of answers they need for writing the magazine. This activity is supported by the course "Philosophy and History of Science and Technology" (in K2). These classes will explain how scientific research in application contexts is performed: how a problem is translated into a scientific

	question: how research is done; and how the findings are applied. Also, attention will be given to learning how to read scientific articles in the engineering sciences. The learning objective of this activity is learning to understand the character of engineering science research, but also learning to deal with information that one only partially understands. Students write about the technology and about the part played by the engineering science research project. Their audience is students and scientific researchers in all disciplines at the UT. They aim at pieces that are explanatory, coherent and well-written for this audience. **III. The social sciences** Students determine societal aspect related to this technological development. Students study in more depth existing research programs and the kind of social science research that is performed in the context of the kinds of societal problems they find relevant for their technology. Their focus will be on the researcher(s) in the social sciences they aim to interview at a later stage. Students prepare the interview. They formulate questions that aim to better understand the investigated topics and their practical implications. Also, they anticipate the kinds of answers they need for writing the magazine. This activity is supported by the course "Philosophy and History of Science and Technology" (in K2). The learning objective of this activity is learning to understand the character of engineering science research, but also learning to deal with information that one only partially understands. Students write about the social science research project. Again, they aim at pieces that are explanatory, coherent and well-written for the intended audience. **IV. PSTS topics** Students aim to find one or more PSTS themes relevant for the themes they have addressed in their magazine. These themes may be philosophical aspects or STS aspects of the technology; philosophical and/or historical aspects of the engineering and social sciences; philosophical aspects of 'high-tech-human-touch; philosophical or ethical aspect of the societal issues, etc. Next, students apply theories and approaches from the four PSTS courses in further analysing these issues. Again, students aim at pieces that are explanatory, coherent and well-written for the intended audience. The final magazine must be a balanced, coherent whole. All students of a group are held responsible for the magazine as a whole.
Examination and assessment	The final version of the magazine will be assessed on: 1. Introduction to the magazine and explanation of the technology. 2. Explanation of the engineering science topic 3. Explanation of the social science topic 4. Explanation of the PSTS topic 5. General quality of the magazine (which includes structure, clarity and attractiveness of the magazine). Mark = (1. + 2. + 3. + 4. + 5.)/5 Students will be asked to distribute this mark amongst them in a way that is doing justice to the contribution of each member. This personal grade is 70% of the final mark. Oral exam in which the progression with respect to the specific learning objectives is assessed. This personal grade is 30% of the final mark.

Learning objectives	This course connects to the final qualifications K1, K3, K4, S1, S2, S3, S4, S8 The TechnoLab project is a first introduction to the kind of integrated projects of a graduated PSTS person in a professional role. The skills and insights that are acquired in the TechnoLab project can be compared to learning how to work as a journalist who wants to inform a high-educated audience about a new technological development. The journalist aims to give several perspectives (technological, engineering sciences, social sciences and PSTS), thus setting-out a typical 'High tech – Human touch' approach, which will be a typical skill of a graduated PSTS person. A journalist has to collect information, formulate relevant questions, understand and interpret what she sees and hears, reflect on those findings, and communicates them to the public in intelligible language and as a coherent whole. In so doing, she needs to have relevant frameworks and perspectives that will enable her to do so. Attaining these frameworks and perspectives is part of Technolab and PSTS as a whole. *Objectives TechnoLab Project* 1. Students are introduced to examples of current technological developments, and their applications in a social context (which involve issues that are dealt with in the PSTS program). 2. Students develop a (more) realistic view of scientific research in both the engineering sciences and the social sciences that takes place in the context of technological developments. 3. Students learn how to get to know and understand an unfamiliar domain, by learning to adequately read, formulate questions and process answers. 4. Students learn to apply the acquired frameworks, perspectives and research questions in PSTS to the themes investigated in the TechnoLab project. 5. Students learn how to write about these topics in an understandable language. The TechnoLab learning objectives (which will be assessed in the oral exam) are made more specific in the handout of this course.

Ethics and Technology I

Course name	Ethics and Technology I			**Course code**	191612540
Participating programme	PSTS			**Phase/ Study period**	M1, 1B
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Prior knowledge for	191612560 Society Politics and technology, 191612580 Ethics and technology 2, 201200062 PhiloLab				
Teaching staff	Dr. J.H. Søraker (coordinator, teacher and first assessor).				
Study material	Will be made available on blackboard.				
Subjects, theories and models	This course aims to introduce students to the major ethical theories and some key thinkers in moral philosophy, as well as the fundamentals of critical reasoning and ethical argumentation. The main ethical theories are virtue ethics, deontological ethics, and utilitarianism, but we will also consider other approaches. The course also includes a short introduction to select application domains, such as engineering and bio-medical ethics.				
Teaching methods	During 8 lectures of 4 hours the theories are explained and discussed.				
Examination and assessment	The assessment is based on two assignments: one report where the students demonstrate knowledge of literature (counting 30%), and one short essay where students demonstrate ability to analyse en ethical problem related to a concrete technology (counting 70%). Additionally, a presentation in front of class is required to pass the course.				
Learning objectives	This course connects to the final qualifications K1, K2, K5, S1, S2, S3,				

	S4 of the programme, according to the following six learning objectives: At the end of the course the student has knowledge of and gained insight in: 1. The most important ethical theories and principles 2. Fundamental guidelines for critical reasoning and ethical argumentation At the end of the course the student is able to 3. Identify ethical problems 4. analyse and critique ethical concepts, theories, and arguments 5. analyse, define, and evaluate ethical problems, both by way of applying ethical theory and independent reasoning 6. analyse how ethics and technology mutually influence each other and to reflect on the role of engineers in this interaction.

Philosophy and History of Science and Technology

Course name	Philosophy and History of Science and Technology			**Course code**	201200061
Participating programme	PSTS			**Phase/ Study period**	M1, 1B
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Teaching staff	Prof. dr. ir. M. Boon (coordinator, teacher and first assessor), dr. F.J. Dijksterhuis.				
Study material	Giere R. et. al. (2006). *Understanding scientific reasoning*. (fifth edition). Wadsworth Cengage Learning. Ladyman, J. (2002). *Understanding philosophy of science*. London: Routledge Further study materials include scientific articles and PPT slides which will be provided through BlackBoard Chunglin Kwa (2011). *Styles of Knowing. A new history of science from ancient times to the present*, Pittsburgh: University of Pittsburgh Press, 2011. 978-0822961512 Thomas Misa (2011). *Leonardo to the Internet. Technology and Culture from the Renaissance to the Present*, Baltimore: Johns Hopkins University Press, 2011. 978-1421401539 Further study materials include electronic articles and powerpoint slides, which will be made available through Blackboard.				
Subjects, theories and models	Scientific theories are generally regarded to be the backbone of scientific and technological practices. They consist of mathematical formulas, laws of nature and scientific models, among other things. But where do these formulas, laws, and models come from, and how do we know where to apply them? This course approaches these questions from combined historical and philosophical perspectives, focusing on the reflections on science in practice. On the one hand we follow the historical development of science to see how practitioners have thought about the ways to acquire knowledge and see where our modern ways of knowing originate. On the other hand we delve into the philosophy of science as it articulates fundamental epistemic issues in the modern sciences. In aiming at an understanding of the engineering sciences from a philosophy of science perspective (rather than from the social or ethical perspective), this course takes traditional themes in the philosophy of science as its starting point. Central themes will be discussed, such as “What is science?” “What is a scientific explanation?” "What is a scientific methodology" “What are laws of nature?” "Are scientific theories true?" “What is a scientific model?”. In this manner, traditional topics such as the logic of scientific reasoning, the induction problem,				

	the demarcation problem and falsificationism, scientific explanation, truth, scientific revolutions, realism and anti-realism, will be addressed. This elementary background in the traditional philosophy of science will be applied for exploring the epistemic relation between science and technology. Why and how do formulas, laws and models give us knowledge anyway? Is it really possible to simply apply basic scientific knowledge for attaining knowledge about concrete (technological) systems? Dealing with these latter questions deviates from traditional introductory courses in the philosophy of science, as it puts much more emphasis on the making of scientific results and the ways in which scientists construct scientific knowledge. At this point, the philosophical perspective and the historical perspective meet and will contribute to each other. Aspects of the history of science that contribute to a more in-depth understanding of how scientific knowledge is produced will be studied. The relation between science, engineering sciences and technology will be discussed from this perspective. Both in the philosophy and the history classes, the differences between various scientific domains will be discussed, as well as the difference between physical and social sciences, and the relation between science and technology. Importantly, the philosophy and history will provide us with different kinds of perspectives and methods. .....
Teaching methods	The philosophy and History classes will run in parallel. Each part consists of 8 lectures. The philosophy part involves several assignments.
Examination and assessment	The assessment of the philosophy part is based on a written final examination. The assessment of the history part is based on..... The final mark will be the average of these two. Each part should be at least 5.5.
Learning objectives	This course connects to the final qualifications K1, K2, K3, K5, S1-4. of the program, according to the following learning objectives: Knowledge of philosophical topics: 1. scientific reasoning and the engineering sciences. 2. the philosophy of science (main philosophers of science, demarcation problem, scientific progress, modes of argumentation in science, scientific explanations, the logic structure of scientific theories, the role of mathematical formalisms, definition theory, instrumentalism, realism, relativism). 3. history of ideas in scientific research.

Philosophical Anthropology and Technology

Course name	Philosophical Anthropology and Technology			**Course code**	191612550
Participating programme	PSTS			**Phase/ Study period**	M1, 2A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Prior knowledge for	Philosophical Anthropology and Human-Technology Relations (191612660)				
Teaching staff	Prof. dr. C. Aydin (coordinator, teacher and first assessor)				
Study material	Scientific articles available on blackboard and PPT slides				
Subjects, theories and models	Philosophical anthropology is the discipline that critically reflects upon questions concerning human nature and the human condition. It				

	addresses questions such as: What is a human being? What is (personal) identity? Which cultural and/or natural features constitute human nature? How is the human being different from (other) animals? These questions have been investigated within different frameworks, such as classical ontology and epistemology (Aristotle, Descartes), German Idealism (Kant, Hegel), economy (Marx), existentialism (Nietzsche, Sartre), and phenomenology (Husserl, Heidegger). In the twentieth century authors like Heidegger, Anders and Ellul have warned us for the negative and destructive influence of technology on our culture. Authors like Plessner and Gehlen have, implicitly or explicitly, argued that technology plays an important role in the constitution of human nature and identity. According to them humans have always shaped and extended themselves by virtue of technical tools and artifacts. In our modern era technology has become not only an inherent part of scientific investigation and diagnosis but also a constitutive dimension of our culture. This has far reaching bearings on our human condition. Today most scholars in philosophy of technology have embraced the so-called "empirical turn" and focus not on "technology" but on different (emerging) technologies and their impact on society. We will, therefore, not only focus on classical approaches to technology but also on specific technologies and technological developments in an anthropological context. In this course we will investigate how technology has influenced and constituted human nature and human existence. We will discuss 1) foundational perspectives in the history of philosophical anthropology; 2) classical views of philosophical anthropology and technology; 3) contemporary perspectives on philosophical anthropology and technology. In the last part of the course the focus will be especially on constructivism, technical mediation, and technical extension. Within these frameworks human nature and its faculties (rationality, self-consciousness, agency, autonomy) are not considered as an a-historical given but as the result of a concrete history in which technology plays an important role. New technologies have an impact on values like freedom, privacy, and friendship, which determine to a great extent how humans are shaped into particular 'subjects.' The sessions will consist of both lectures and discussions. Besides texts, also movies and documentaries will be part of the course material.
Teaching methods	The sessions will consist of both lectures and seminars.
Examination and assessment	The assessment is based on a take-home exam and an essay.
Learning objectives	This course connects to the final qualifications K1, K2, K5, S1-4 of the program, according to the following eight learning objectives: At the end of the course the student has knowledge of and insight in: 1. the history of philosophical anthropology 2. classical views of philosophical anthropology and technology 3. contemporary theories and discussions regarding the influence of technology on human nature, such as the human enhancement debate, constructivism, technical mediation and technical extension At the end of the course the student is able to: 4. analyze and reproduce major topics, theories, developments and approaches in philosophical anthropology and their relevance for technology. 5. discuss the merits and shortcomings of theories and ideas related to philosophical anthropology and technology and to

	compare and contrast different positions with each other. 6. discuss his views with fellow students, write interpretative essays and present his views orally in class 7. show satisfactory competence in writing a philosophical paper.

Society, Politics and Technology

Course name	Society, Politics and Technology			**Course code**	191612560
Participating programme	PSTS			**Phase/ Study period**	M1, 2A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Requirements for entrance	Recommended: Ethics and Technology 1 (191612540)				
Teaching staff	Dr. M.J.K. Coeckelbergh (coordinator, teacher and first assessor).				
Study material	Swift, A. (2001/2006). *Political Philosophy; a beginners' guide for students and politicians.* Cambridge: Polity press. Further study materials include scientific articles and PPT slides.				
Subjects, theories and models	Technology is a major force in social and political reality. This course introduces the students to five main discussions within social and political philosophy: on democracy, social justice, freedom, equality and community. Students will learn to relate these discussions to the political philosophy of technology, both in its classical en contemporary forms.				
Teaching methods	During 8 lectures of 4 hours the theories are discussed. Students practice in presentation and argumentation concerning the implications of technology for democracy, social justice, freedom, equality and community. Attendance is obligatory.				
Examination and assessment	The assessment is based on group participation (has to be sufficient), oral presentation (has to be sufficient) and a paper assignment (100% of the mark).				
Learning objectives	This course connects especially to final qualification K1, K2 and K5 since by offering this course on philosophy of technology and politics it deepens the knowledge of philosophy of technology and its relation to social sciences (K1) and provides essential knowledge about the subfield social and political philosophy of technology (K2).By making a direct link to political philosophy, the course also contributes to K5, since the students get the opportunity to get a good understanding of how philosophy of technology relates to political philosophy. At the end of the course the student has knowledge of or insight in: 1. political philosophy in general. 2. the political philosophy of technology in particular. This course connects to final qualification S1-4 of the programme At the end of the course the student is able to: 3. apply concepts and theories of political philosophy (both in its general and in its applied-to-technology form) to problems related to the role of technology in society and culture. 4. participate in a collective deliberation 5. identify and analyze particular problems in this domain 6. analyze the literature in this domain 7. analyze arguments in particular debates in this domain 8. formulate and argue one's his/her own position with regard to a particular issue				

Technology and Social Order

Course name	Technology and Social Order	**Course code**	191622510
Participating programme	PSTS	**Phase/ Study period**	M1, 2B

Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Teaching staff	Prof. dr. L. Roberts				
Study material	Study materials include academic articles and PPT slides.				
Subjects, theories and models	The relationship between technology and technological development, on one hand, and society, on the other, has been variously theorized and examined by a number of significant philosophers, sociologists and historians. In this course students are introduced to the range of interpretive visions regarding their relation, which includes variations on the themes of 'technological determinism', 'social shaping', 'mediation', 'co-production', ethical engineering and 'hybridity'. Both the philosophical presuppositions and commitments behind these various interpretive frameworks are also examined and the consequences of adopting them both for interpreting the past and advising for the future are considered.				
Teaching methods	During 8 interactive lectures of 4 hours the theory is discussed.				
Examination and assessment	The assessment is based on three short essay assignments (the first two count for 20% and the third for 30% of the final mark). The other 20% of the mark is based on in-class presentations, participation and preparation of the 'weekly protocol'. (Protocol: Students take turn serving as class scribe each week, taking notes on what is discussed. In consultation with the instructor, they then transform their notes into an analytical presentation of the issues discussed in class, enriched - if relevant - with annotated bibliographical references.)				
Learning objectives	This course connects to the final qualifications K1, K3, S1, S2, S3, S4 of the programme, according to the following five learning objectives: At the end of the course the student has knowledge of or insight in: 1. the relations between technology and society, drawn from an interdisciplinary approach that brings history, philosophy and sociology in conversation with each other. At the end of the course the student is able to: 2. analyze discussions about technology and understand the methodological perspective from which they are written. 3. understand the analytical consequences of adopting a particular approach to the study of technology and its relation to social order. 4. discuss his views with fellow students, write interpretative essays and present his views orally in class. 5. offer an informative report of course proceedings, write well-organized analytical essays and discern the analytical perspective that informs what he reads.				

Ethics and Technology II

Course name	Ethics and Technology II			**Course code**	191612580
Participating programme	PSTS			**Phase/ Study period**	M1, 2B
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Requirements for entrance	Ethics and technology 1 (191612540) Twente Graduate School students and other external students will need to attend an additional introductory lecture.				
Teaching staff	Dr. J.H. Søraker (coordinator, teacher and first assessor), Selected guest speakers				
Study material	Articles and book chapters will be posted on blackboard.				
Subjects, theories and models	In a modern society technology is everywhere, touching everything we do. Such a pervasive force calls for moral reflection. In what direction should technology be steered? What are the key concepts and theories moral philosophy has to offer for such a moral deliberation on				

	technology? These are questions that will be discussed in this course. The course consists of a series of guest lecturers who will present and discuss within their area of expertise, thereby showing the many ways in which ethics can be applied to technology – from a range of different approaches. The topics are decided for each quartile but typically include issues like sustainable development, robot ethics, intellectual property, bio-medical technology, transhumanism, virtual worlds, risk assessment and digital divides.
Teaching methods	Each week, guest lecturers present and discuss their own research. Students select one class for which they act as "experts of the week"
Examination and assessment	The assessment is based on group participation (has to be sufficient), individual oral presentation (has to be sufficient) and an individual final paper (100% of the mark).
Learning objectives	This course connects to the final qualifications K1, K2, K5, S1-S6 of the programme, according to the following four learning objectives: At the end of the course the student has knowledge of or insight in: 1. central discussions and topics in technology ethics; capita selecta At the end of the course the student is able to: 2. apply ethical concepts and theories (both in its general and in its applied-to-technology form) to problems related to the role of technology in society and culture. 3. discuss and critique contemporary research in ethics & technology At the end of the course the student: 4. has acquired skills in writing and verbal communication. 5. has acquired skills in reasoning and arguing, analysis for reasoning and arguments, critical analysis and evaluation of texts.

PhiloLab

Course name	PhiloLab			**Course code**	201200062
Participating programme	PSTS			**Phase/ Study period**	M1, 2B
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Requirements for entrance	Technolab 20120058, Philosopical Theories and Methods (201200059), Introduction to Philosophy of Technology (191612510), Introduction in STS (191622500), Ethics and Technology 1 (191612540)				
Teaching staff	Dr. Ir. E.C.J. van Oost (coordinator, teacher and first assessor), Dr. P. Vermaas and various other staff members (teachers and co-assessors).				
Study material	The literature will vary every year. Students will have to read 4 scientific papers of staff members. For the refereeing students need to read an additional selection of papers. For their own paper students have to read more new specialised literature as provided by the staff-tutor.				
Subjects, theories and models	This course is built around an academic workshop in philosophy of science, technology and society. It is supervised by staff members of the research groups and institutes that participate in the Master programme. Each supervisor brings in a paper written by him or her that is representative for the type of research done in his or her institute/ research group. Students study the papers and then divide in groups. Each group studies one of the papers in more detail. Supervision can be done in part by electronic means. The academic workshop itself consists of a more formal day, during which the supervisors of the participating				

	institutes present papers and students discuss the papers. The course is closed with a 'graduate conference' day, during which the students present and discuss their results. Students finish the course by writing a short academic essay on a topic related to one of the papers. The objectives are to introduce students to the research specializations of the participating research groups, and to develop their writing and presenting skills. The students will receive a special training in oral presentations.
Teaching methods	See above description of the workshop and excursion and assignment
Examination and assessment	Assignment and presentation, attendance of at least four colloquia in departments Philosophy and Steps.
Learning objectives	This course contributes to the final knowledge qualifications K1, K2 and K3 and skills qualifications S1 and S2 (the emphasized skills in year 1) and a start on S4 and S8. These qualifications are linked to the following three learning objectives: At the end of the course the student has knowledge of or insight in: 1. the research specializations of the participating research groups. At the end of the course the student is able to 2. to formulate a perspective from which scientific work is discussed by using gained knowledge from prior PSTS courses. At the end of the course the student: 3. will have developed his writing, presenting and communicating skills.

PSTS 2013-2014 Second Year

Schedule 2d Year

<table>
<tr><th rowspan="2">Profile</th><th colspan="2">Term 1</th><th colspan="2">Term 2</th></tr>
<tr><th>Block 1A</th><th>Block 1B</th><th>Block 2A</th><th>Block 2B</th></tr>
<tr><td rowspan="4">Profile 1

Technology and the Human Being</td><td>Philosophical Anthropology and Human-Technology Relations
5 EC</td><td>Philosophy of Mind and Body and Technology
5 EC</td><td colspan="2" rowspan="4">Academic Profile
Master’s Thesis 30 EC
MasterLab 2 (EC’s: part of the Master’s thesis – with all students)

Professional profile
Internship 10 EC
Master’s Thesis 20 EC
MasterLab 2 (EC’s: part of the Master’s thesis – with all students)</td></tr>
<tr><td>Shaping Technology and Use
5 EC</td><td>Elective taken from another profile
5 EC</td></tr>
<tr><td>Elective taken from another profile
5 EC</td><td rowspan="2">MasterLab 1
(with all students)
5 EC</td></tr>
<tr><td>MasterLab 1</td></tr>
<tr><td rowspan="4">Profile 2

Technology and Values</td><td>Technology and the Quality of Life
5 EC</td><td>Assessment of Emerging Technologies
5 EC</td><td colspan="2" rowspan="4">Academic Profile
Master’s Thesis 30 EC
MasterLab 2 (EC’s: part of the Master’s thesis - with all students)

Professional profile
Internship 10 EC
Master’s Thesis 20 EC
MasterLab 2 (EC’s: part of the Master’s thesis – with all students)</td></tr>
<tr><td>Technology, Globalization and the Environment
5 EC</td><td>Elective taken from another profile
5 EC</td></tr>
<tr><td>Elective taken from another profile
5 EC</td><td rowspan="2">MasterLab 1
(with all students)
5 EC</td></tr>
<tr><td>MasterLab 1</td></tr>
<tr><td rowspan="4">Profile 3

Dynamics of Science, Technology and Society</td><td>Philosophy of Science and Technology Relations
5 EC</td><td>Spatial and Temporal Dynamics of Science, Technology and Society
5 EC</td><td colspan="2" rowspan="4">Academic Profile
Master’s Thesis 30 EC
MasterLab 2 (EC’s: part of the Master’s thesis – with all students)

Professional profile
Internship 10 EC
Master’s Thesis 20 EC
MasterLab 2 (EC’s: part of the Master’s thesis – with all students)</td></tr>
<tr><td>Dynamics and Governance of Socio-Technical Change
5 EC</td><td>Elective taken from another profile
5 EC</td></tr>
<tr><td>Elective taken from another profile
5 EC</td><td rowspan="2">MasterLab 1
(with all students)
5 EC</td></tr>
<tr><td>MasterLab 1</td></tr>
</table>

First Term
Students take the three obligatory courses of their profile (15 EC’s) and choose 2 elective courses (10 EC’s)
Masterlab 1 (5 EC’s) is followed parallel to the module and elective courses. It starts in the first quarter with a limited number of meetings. In quarter 2 MasterLab 1 is scheduled for one afternoon a week.

Second Term
MasterLab 2 is scheduled for one afternoon in two weeks.

Course Descriptions 2d Year

Description profile TECHNOLOGY AND THE HUMAN BEING

What is a human being? What is (personal) identity? Which cultural and/or natural features constitute human nature? How is the human being different from (other) animals? These questions revolve around how to understand and conceptualize the human condition and have been investigated within different frameworks, such as classical ontology (Aristotle), economy (Marx), phenomenology (Scheler, Heidegger), existentialism (Kierkegaard, Sartre), and psychoanalysis (Freud). In the twentieth century authors like Plessner, Gehlen, and Foucault have, implicitly or explicitly, argued that technology plays an important role in the constitution of human nature and identity. According to them humans have always shaped and extended themselves by virtue of technical tools and artifacts. In our modern era technology (microscopes, MIR-scans) has become an inherent part of scientific investigation and diagnosis, which also has bearings on our view of human nature.
This profile focuses on how technology influences and constitutes human nature and human existence. In this context we will also study how in the interaction between the human actor and technological artefacts traditional boundaries between design and use are blurred. The rapid development of mind and body enhancing technologies and their influence on human faculties such as rationality, self-consciousness, agency, and autonomy is another important topic of inquiry in this cluster. In addition, we will also reflect on the moral impact of these technologies on our life.

At the end of the course the student has knowledge of and insight in:

- theories/approaches that explain the influence of technology on human nature
- contemporary views of the human condition (hybrids, cyborgs)
- different types of technical extension and mediation
- the role of technologies in subjectivation processes
- theories that explain the blurring boundaries between design and use
- epistemological and moral implications of mind and body enhancing technologies

Obligatory courses Profile 1 TECHNOLOGY AND THE HUMAN BEING

Course name	Philosophical Anthropology and Human-Technology Relations			**Course code**	191612660
Participating programme	PSTS			**Phase**	M2, 1A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Requirements for Entrance	At least 40 EC from M1.				
Teaching staff	Prof. dr. P.P. Verbeek				
Study material	Study materials include scientific articles and PPT slides.				
Subjects, theories and models	This course acquaints students with the state of the art in philosophical-anthropological approaches in philosophy of technology. The course focuses on the relations between human beings and technologies, ranging from behavior-steering technology to human enhancement technology, and on ways to assess and improve the quality of these relations. The course develops three lines. Students will be introduced to the basic discussions in these three lines. After that, they choose one of the three lines to get acquainted with state of the art literature and to write a paper. The lines are: (1) Material Morality. By mediating human experiences and practices, technologies have come to play an important role in our moral actions and decisions. (2) Technology and the Limits of Humanity. Technological developments have started to interfere explicitly with human nature. Biotechnologies, brain implants, and enhancement technologies make it possible to reshape humanity in various ways. (3) Art, Technology, and Culture. Technologies help to organize the sensory repertoire of human beings: they disclose new ways of experiencing reality. The				

	ways in which artists experiment with such mediations, therefore, form a highly interesting point of application for the philosophy of contemporary art. Also, this line includes the cultural dimension of human-technology relations and the mediation aspects involved in technology transfer between cultures.
Teaching methods	There will be 6 lectures of 4 hours. First, there will be 3 meetings on the three lines of the course. After this, there will be an individual start meeting for writing a paper, a progress meeting in which students present a draft paper, and a plenary final meeting in which students present the final result of their work.
Assessment	The assessment is based on an individual paper assignment (100% of the mark), the quality of participation in meetings, the presentations and the brief summaries to be written about the study material.
Learning objectives	This course connects to the final qualifications K1-2, K5-6, S1-4, S6-8 of the programme, according to the following eight learning objectives: At the end of the course the student has knowledge of or insight in: 1. the state of the art in philosophical-anthropological approaches in philosophy of technology. 2. the ethics and anthropology of human enhancement. 3. the relations between moral agency and technological artifacts. 4. the relations between art and technology. At the end of the course the student is able to: 1. write a research paper on a philosophical-anthropological discussion in the philosophy of technology. 2. analyze and assess the philosophical-anthropological implications of a technological development. 3. present a research paper on a philosophical-anthropological discussion in the philosophy of technology. 4. find his/her way in philosophical-anthropological literature.

Course name	Shaping Technology and Use			**Course code**	191622630
Participating programme	PSTS			**Phase**	M2, 1A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Requirements for Entrance	At least 40 EC from M1.				
Teaching staff	Dr. E.C.J. van Oost				
Study material	Study materials include scientific articles.				
Subjects, theories and models	The central question of this course is: how do human actors through interactions with technological artefacts not only mould their daily life but also (re)shape the technology itself. Users have transcended their status of “passive consumers”. Current phenomena like Web 2.0, Open Source, Wikepedia, etc. are all examples of active, producing users. This active agency in shaping technology in daily activities blurs traditional boundaries between design and use. In the course students will get acquainted with four interrelated scientific fields that all contribute to understanding the changing design-use relations. These are: (1) STS, with special focus on Actor Network Theory: Sociology of translation in networks is elaborated. The script analysis allows for granting the agency of the artefacts themselves. Attachment is a second phenomenon that is analyzed in terms of ANT. (2) Media Studies: In the domestication theory the focus of analysis shifts to the agency of users in the appropriation of technological artefacts. (3) Innovation Studies conceptualizes the dynamics of user/user community innovation. (4) Sociology: Giddens’ structuration theory is integrated with STS insights into a conceptual framing of “Duality of				

	Technology". A substantial part of this course encompasses the design and execution of a small empirical research project. The students will learn all steps involved in a research design (research question – theoretical framework – choice of method and data – operationalisation of theoretical concepts – gathering data - interpreting data in theoretical terms – conclusion). The core theories are Actor-Network Theory, Sociology of Translation, Domestication Theory, Structuration Theory and User-innovators perspective. The recent developments that integrate STS with media and innovation studies are studied and discussed in class. The small research project also uses recent research.
Teaching methods	During 7 seminars of 2 hours the theory will be discussed. Active participation of students is required. Students have to read texts I advance and prepare discussions on the content.
Assessment	The assessment is based on two home assignments (together 25% of the mark) and one final assignment (75% of the mark). In the first home assignment students have to apply theoretical concepts to their own empirical experiences. In the second one students must compare and discuss theoretical concepts. The final assignment has the aim to acquaint students with theory informed empirical research. Active participation in class is obligatory
Learning objectives	This course connects to the final qualifications K1, K3-K6, S1-S4, S6-8 of the programme, according to the following three learning objectives: At the end of the course the student has knowledge of or insight in: 1. theoretical STS-perspectives on processes of co-shaping of design and use of technological artefacts. 2. Qualitative methods of empirical research. At the end of the course the student is able to: 3. combine theoretical perspectives with empirical data (from a first experience of conducting empirical research). 4. To write a coherent academic paper based on theoretically informed empirical research

Course name	Philosophy of Mind, Body and Technology			**Course code**	
Participating programme	PSTS			**Phase**	M2, 1B
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Requirements for Entrance	At least 40 EC from M1.				
Teaching staff	Prof. dr. C. Aydin				
Study material	Reader				
Subjects, theories and models	This course acquaints students with current theories and approaches to the relations between mind, body, and technology. (A) The theme of technology and the body will take Merleau-Ponty's philosophy of the body as a starting point. From there, it will move to Canguilhem's theory of Organism versus Machine, Don Ihde's theory of 'Bodies in Technology', and Vivian Sobchak's work on techno-bodies. Central questions are: how can the relations between bodies and technology be conceptualized? What role can the body play in future philosophy of technology? (B) Philosophy of mind studies the nature of the mind, mental events, mental functions, mental properties, consciousness and their relationship to the physical body, particularly the brain. Questions are raises such as: What do we				

	mean by mind? How do we attribute mentality? How are mental and physical properties related? What is consciousness? An overview of these themes will be offered as a general framework. To address the theme of mind and technology, the course will focus on Andy Clark's theory of embodied embedded cognition, which links technology and the philosophy of mind. In that context also internalist and externalist approaches to mind, as well as the notion of introspection, will be discussed. After studying the central elements of Clark's 'Natural Born Cyborgs', the focus will be on its relevance for philosophy of technology, and its reception by philosophers of technology (e.g. Selinger). (C) Finally, the course will bring these lines together by addressing issues of identity and technology, focusing on brain technologies and prosthetic technologies in relation to people's self-understanding and sense of personal identity.
Teaching methods	The course has a seminar setting. There will be 7 sessions of 4 hours. In these sessions, students will discuss texts they have studied before the meetings. After an introductory meeting, there will be 4 meetings about technology, mind, and body, followed by a meeting where students present paper outlines and a meeting where they present and peer review draft papers.
Assessment	The assessment is based on an individual paper assignment (100% of the mark), the quality of participation in meetings, the presentations and the brief summaries to be written about the study material.
Learning objectives	This course connects to the final qualifications K1-2, K5-6, S1-4, S6-8 according to the following five learning objectives: At the end of the course the student has knowledge of or insight in: 1. philosophical approaches to technology and the body 2. philosophical approaches to technology and the human mind 3. the relations between technology and identity 4. contemporary analyses of the relations between mind, body, and technology At the end of the course the student is able to: 5. write a research paper on a philosophical problem regarding the relations between mind, body, and technology

Description profile TECHNOLOGY AND VALUES

This profile focuses on normative, evaluative and critical issues in relation to technology and society. Its central questions are how technology can be developed and used in an ethical way, what good technology is, and how both society and engineering should be organized so as to have technology that is ethically and politically acceptable. The normative focus of the cluster is reflected in its emphasis on public and private values, in relation to individuals and society, and evaluates or prescribes directions for the development of technology according to these values. Values that are studied include freedom, justice, democracy, autonomy, privacy, human dignity, the intrinsic value of humans and nature, responsibility and well-being. Technologies that are studied include information technology and robotics, biomedical technology, nanotechnology, environmental technology, and others. Topics include ethical development of technology, ethical use of technology, the ethics and politics of regulating technology, ethics of emerging technologies, technology and the good life, technology and the quality of society, technology and the environment, technology and globalization and others. The cluster focuses on studies in ethics and social and political philosophy and combines these with studies from other disciplines, including science and technology studies (technology assessment, sociology of users, scenario studies, governance studies), social sciences, engineering and medicine.

Obligatory courses profile 2 TECHNOLOGY AND VALUES

Course name	Technology and the Quality of Life			**Course code**	191612670
Participating programme	PSTS			**Phase**	M2, 1A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Requirements for Entrance					
Teaching staff	Dr. J.H Søraker; prof.dr. P.A.E. Brey				
Study material	Scientific articles posted on blackboard				
Subjects, theories and models	This course introduces the philosophy and ethics of technology in terms of the good life (also known as quality of life or well-being). The question of what a good life consists of has always been one of the major questions of philosophy. It is also a prominent question in the philosophy of technology, as many evaluations of technology ultimately centre around the question whether particular technologies make our lives better. This course examines philosophical theories of the good life, philosophical theories of technology in relation to the good life. The course also addresses empirical research on subjective well-being, and its applicability to technology assessment. The first part of the course focuses on philosophical theories of the good life, including hedonism, desire-satisfactionism, and objectivist theories of the good life, as well as corresponding research in the social sciences. The second part then relates these to technology, and discusses particular technologies, such as information technology, sustainable technology and medical technology in relation to the quality of life. The aims of the course are both to introduce current theories of the good life and to gain training in applying these theories in the analysis of particular technologies and technological practices.				
Teaching methods	4 interactive lectures of 4 hours, then individual supervision.				
Assessment	The assessment is based on participation in class (30% of the final mark) and an individual paper assignment (70% of the mark).				
Learning objectives	This course connects to the final qualifications K1-2, K5-6, S1-4, S6-8 of the programme, according to the following seven learning				

	objectives: At the end of the course the student has knowledge of or insight in: 1. philosophical theories of the good life. 2. philosophical theories of technology in relation to the good life. 3. philosophical studies of particular technologies in relation to the good life. 4. philosophical theories of the place of conceptions of the good life in politics. 5. Empirical research on subjective well-being At the end of the course the student is able to: 1. apply philosophical theories of the good life in the analysis of technologies and technological practices. 2. evaluate the strengths and weaknesses of existing theories of the good life and technology. 3. understand and apply empirical research on subjective well-being 4. utilize philosophical theories of technology and the good life to develop a theoretical position of one's own.

Course name	Technology, Globalization and the Environment			**Course code**	
Participating programme	PSTS			**Phase**	M2, 1A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Requirements for Entrance					
Teaching staff	Dr. M. Coeckelbergh				
Study material	Study materials include scientific articles and PPT slides. All will be made available via Blackboard.				
Subjects, theories and models	This course invites students to reflect on problems regarding the relation between technologies and globalization. Particular attention will be paid to electronic information and communication technologies and to specific topics related to geography, society, politics, energy, animals, and especially environment. We will focus on questions such as: Does globalization lead to what McLuhan called a “global village”? Do new ICTs “shrink” the world, and in what sense? Do they imply the “death of geography”, or does place and space still matter? If so, how? What kind of “global society”, “global community” or “global culture” is created, if any? Is the network society a “society”? How do the new technologies influence how we think about cultural difference? Do new media lead us to reconsider the duties we have to strangers? Should animals be part of the global moral community? Is technological and economic globalization necessarily followed by moral and social globalization? How do new technologies shape global finance? Do new electronic military technologies change international politics and warfare in the 21st century? What is the role of technology in coping with global climate change? Are new energy technologies such as smart grids helping to build a more sustainable world? How can ICTs be developed in a way that aids sustainability? How do they shape the way we frame environmental problems? What are conceptual and empirical relations between nature, technology, and environment? The students will be encouraged to engage with these questions by using philosophical methods (conceptual analysis, argumentation) and by using and producing interdisciplinary research.				
Teaching methods	Lectures, seminars				
Assessment	The assessment is based on presentations and group participation				

	(has to be sufficient) an individual paper assignment : an essay (graded).
Learning objectives	This course connects to the final qualifications K1, K2, K6 and S1-5 and S8 of the programme, according to the following learning objectives: At the end of the course the student has knowledge of or insight in 1. problems concerning the relation between technologies and globalization 2. specific topics in this domain such as technology and environmental problems At the end of the course the student is able to… 1. analyze the problems concerning the relation between technology and globalization 2. identify and analyze particular problems in this domain 3. analyze the literature in this domain 4. analyze arguments in particular debates in this domain 5. formulate and argue one's his/her own position with regard to a particular issue 5. perform original research in this field, or make at least a serious effort to do so 6. communicate research to colleagues

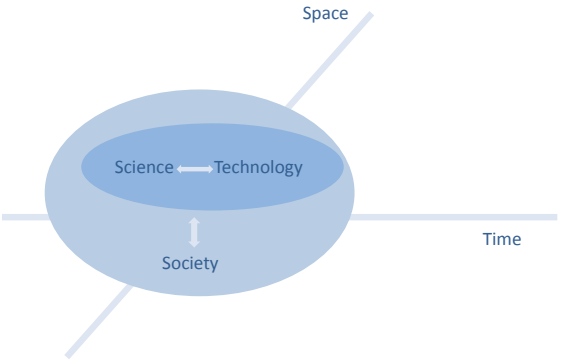
Course name	Assessment of Emerging Technologies			**Course code**	
Participating programme	PSTS			**Phase**	M2, 1B
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Requirements for Entrance					
Teaching staff	Dr. M. Boenink, Dr. K. Konrad				
Study material	Study materials include scientific articles and PPT slides. All will be made available via Blackboard.				
Subjects, theories and models	This course focuses on the complexities of anticipating, normatively assessing and shaping technologies in development. In ethics of technology, governance theories as well as technology assessment, it is now commonplace to state that the course of technology development should be anticipated and that its desirability should be assessed early on. If technology development progresses, it tends to become too entrenched to change its direction. This means, however, that early anticipation and assessment have to take place at a stage when uncertainties abound. Such uncertainties affect both the 'doing' (innovation processes) and the assessing of technologies in development. Both assessment and action build on expectations, rather than robust knowledge. Understanding patterns of expectation-building, for instance social dynamics of expectations, but also patterns of assessment, such as patterns of moral argumentation, are useful to understand de-facto assessment as well as to design appropriate methods for dedicated ethical assessment. The course invites students to critically reflect on the possibilities and difficulties of anticipating and evaluating the desirability of emerging technologies, and to study and develop methods for early anticipation and evaluation that take the surrounding uncertainties into account. The precise setup of the course varies each year, since it is adjusted to ongoing research by several staff members.				
Teaching methods	Lectures, seminars Attendance is obligatory.				
Assessment	The assessment is based on group participation (has to be sufficient),				

	assignments (30 % of the final grade) and an individual paper assignment (70% of the final grade).
Learning objectives	This course connects to the final qualifications K4-6 and S4-9 of the programme, according to the following nine learning objectives: At the end of the course the student has knowledge of or insight in 1. the uncertainties in processes of technology development, as well as assessment of those processes and their products 2. the state of the art in theory and practice of anticipating and (ethically) assessing emerging technologies, as well as their philosophical underpinning3. philosophical and empirical research strategies to improve the quality of both theoretical approaches and practices of anticipating and assessing emerging technologies At the end of the course the student is able to 3. analyze the social dynamics of expectations and the patterns of moral argumentation concerning emerging technologies 4. to diagnose the uncertainties in actual innovation processes 5. critically compare and evaluate different methods to anticipate and ethically assess emerging technologies 6. formulate and argue one's own position with regard to the anticipation and assessment of technologies in development 7. to articulate and defend one's own position with regard to methods for anticipating and assessing technologies in development 8. communicate research and solutions to colleagues as well as professionals from other subject areas. 9. to generate learning processes from the interaction.

Description profile DYNAMICS OF SCIENCE, TECHNOLOGY AND SOCIETY

This cluster explores the dynamics of science, technology and society by focusing on their practices, interactions, institutional and material arrangements, and their dynamic co-evolution. Key questions which will be addressed are: How is knowledge production shaped by its concrete practices and by the material and conceptual resources (instruments, models, laboratory settings) – of its time, in a particular place or discipline? How do science and society mutually shape each other? Which patterns follow socio-technical change? What are possibilities and limitations of governing socio-technical change? How can these insights be mobilized for concrete innovation processes, such as supporting a more sustainable energy system?

In the courses we move from a detailed view of processes of knowledge production on the laboratory floor, to a broader perspective, which addresses how socio-technical systems are embedded in particular ways of usage, production and regulation and how socio-technical change may come about. Finally, we expand historically and geographically, in order to better conceive of how practices, arrangements and dynamics of science, technology and society are situated in time and space. The cluster is self-consciously interdisciplinary, drawing on the perspectives and tools of philosophy, sociology, history and geography.



Obligatory courses profile DYNAMICS OF SCIENCE, TECHNOLOGY AND SOCIETY

Course name	**Philosophy of Science and Technology Relations**			**Course code**	
Participating programme	PSTS			**Phase/ Study period**	M2, 1A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Teaching staff	Prof. dr. ir. Mieke Boon				
Study material	Academic articles (provided on Blackboard) and presentations in the current field of the philosophy of science in practice. Additionally, students are expected to search for relevant literature themselves (in particular for the final essay).				
Subjects, theories and models	To understand the dynamics of science, technology and society, we need to know what scientific practices are like. This course aims at a better understanding of the internal dynamics of scientific research in the context of technological applications, with a focus on epistemological issues. The approach of this course is a *Capita Selecta* in the so-called *Philosophy of Science in Practice*. The philosophy of science in practice (PSP) is a relatively new branch on the tree of the philosophy of science. Some salient aspects of its general approach are: 1. PSP is concerned with not only the acquisition and validation of knowledge, but also its use. Its concern is not only about how pre-existing knowledge gets applied to practical ends, but also about how knowledge itself is fundamentally shaped by its intended use. PSP aims to build meaningful bridges between the philosophy of science and the newer fields of philosophy of technology and philosophy of medicine; and				

	provide fresh perspectives for the latter fields. 2. It emphasizes how human artifacts, such as conceptual models and laboratory instruments, mediate between theories and the world. It seeks to elucidate the role that these artifacts play in the shaping of scientific practice. 3. Its view of scientific practice must not be distorted by lopsided attention to certain areas of science. The traditional focus on fundamental physics is supplemented by attention to other fields such as economics and other social/human sciences, the engineering sciences, and the medical sciences. 4. In its methodology, it is crucial to have a productive interaction between philosophical reasoning and a study of actual scientific practices, past and present. This provides a strong rationale for history-and-philosophy of science as an integrated discipline, and also for inviting the participation of practicing scientists, engineers and policymakers. The attractiveness of this new and prolific field is its openness to new philosophical ideas and approaches. Moreover, philosophy of science in practice aims at results that are not only relevant for the philosophical discipline itself, but also for a better understanding these practices from the perspectives of scientists, engineers, policy-makers and many others.
Teaching methods	During 7 seminars of 4 hours, the articles are discussed. Students prepare by making assignments, reading each other's assignments and making well-informed comments. The assignments are a step-by-step-development of the final essay.
Examination and assessment	The assessment is based on active involvement in the sessions and collective discussions (has to be sufficient), interim assignments (have to be sufficient) and a final essay (100% of the mark).
Learning objectives	This course connects to the final qualifications K1-6. S4-9 of the programme, according to the following learning objectives: Content: - A broad overview in the new field called *Philosophy of Science in Practice*, both regarding its philosophical topics and methodologies. - Philosophical and practical understanding of the epistemological relationship(s) between scientific research and technological development. Skills: At the end of this course, the student is able to: a) Read texts of both traditional and contemporary authors in the philosophy of science. b) Analyze the structure and arguments of a philosophical text. c) Reconstruct the presuppositions made in a philosophical text. d) Formulate problems of scientific practices, and to translate them in a philosophical research project.

Course name	Dynamics and Governance of Socio-Technical Change			**Course code**	
Participating programme	PSTS			**Phase/ Study period**	M2, 1A
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Teaching staff	Dr. K.E. Konrad				
Study material	Academic articles (provided on Blackboard) and presentations. Additionally, students are expected to search for relevant literature themselves (in particular for the final essay).				

Subjects, theories and models	Understanding the patterns and dynamics of socio-technical change is crucial for diagnosis of ongoing developments as well as for governance and innovation. In this course we focus on the co-evolutionary dynamics of technology and society based on an understanding of technology as embedded in specific organizational, institutional and social arrangements, such as particular ways of using, producing, innovating and regulating a technology. We will reflect on the implications of such a mutual dependence of technological and societal structures – for the regular 'working' of socio-technical systems, for innovation and socio-technical change and for possibilities and limitations of governing socio-technical change. 'Governance' implies that we are not primarily interested in government and policy action, but that heterogeneous societal actors, such as firms, public organisations, citizens and social movements have a role in modulating change as well. In this course, we will read and discuss literature on the dynamics and patterns of socio-technical change, focusing in particular on approaches drawing on insights from STS and evolutionary theories (e.g. socio-technical systems and regimes, multi-level dynamics). Furthermore, we will discuss possibilities and limitations for governing these processes and learn about concrete governance approaches and their application that have been developed on the basis of these insights, such as Transition Management, Strategic Niche Management or Constructive Technology Assessment.
Teaching methods	During 8 seminars of 2 hours, concepts and empirical cases are discussed. Discussions are prepared by the students via reading, assignments and partly presentations.
Examination and assessment	The assessment is based on delivery of assignments (graded at least as sufficient) and an individual paper assignment (graded with half grades; quality of assignments may lead to rounding up or down of grades.)
Learning objectives	This course connects to the final qualifications K1, K3, K4, K6, S1-S5, S7 of the programme, according to the following learning objectives: At the end of the course the student: 1. knows concepts and theories from science, technology and innovation studies addressing socio-technical relations and dynamics 2. knows concepts of governance, in particular governance of technology 3. knows concrete governance approaches developed on the basis of these concepts and empirical examples 4. is able to reflect on the merits and shortcomings of concepts / approaches. 5. is able to apply concepts to concrete cases. 6. is able to develop an analytical / research question and treat it in a structured way drawing on appropriate sources in the form of a small essay.

Course name	**Spatial and Temporal Dynamics of Science, Technology and Society**			**Course code**	
Participating programme	PSTS			**Phase/ Study period**	M2, 1B
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Teaching staff	Prof. dr. L.L. Roberts				
Study material	Study materials (available on blackboard) include primary source material, scientific articles and PPT slides.				
Subjects, theories and models	The dynamics of science and technology are situated in time and space. Their movement through these dimensions informs both their practical character and development, whether at the local and short-				

	term level of a laboratory or the extensive and long-term level of global travel and exchange. This course takes the spatio-temporal geography of science, technology and society seriously: not just as providing a context in which science and technology take place, but as both a constituting element of their dynamics and an evolving consequence thereof. Topics covered will include: • the ways in which geography and development over time are generally treated in philosophical, sociological and historical studies of science and technology - and the analytical consequences thereof; • the role of a laboratory's internal geography (its architecture and furnishings) and 'external' setting in the production of knowledge; • the long-term development of science as a mutually constitutive element of global history, with a special focus on imperialism and globalization • the history and future of innovation in global context, with a critical examination of '(post-) industrial revolutions'
Teaching methods	During 7 seminars of 4 hours, students and instructor work together to interpret and discuss weekly reading assignments in relation to weekly themes. Students prepare by reading course material, making notes in keeping with guiding questions provided by instructor. Individual students are assigned the task of serving as recording secretary for each session. Notes are then revised in consultation with instructor to form analytical record of the session (the weekly 'protocol'), which is distributed the following week. Students write three interpretive essays based on reading material and in-class discussions.
Examination and assessment	The assessment is based on active involvement in the sessions and collective discussions (has to be sufficient), written protocol, three written essays.
Learning objectives	This course connects to the final qualifications K1, 3,4,6, S1-S4,6,7,9 of the programme, according to the following seven learning objectives: At the end of the course the student has knowledge of or insight in: • how authors frame their analyses of science and technology in spatial and temporal terms and the impact that this has on their analyses; • science and technology dynamics from a long-term perspective that isn't bounded by a Euro-centric perspective; • the mutually-constitutive roles played by science and technology in global history. At the end of the course the student is able to: 1. analyze academic texts - whether philosophical, sociological or historical in nature - and determine its thesis, as well as the presuppositions on which it builds. 2. transform lecture and discussion notes into an analytical presentation. 3. interpretatively relate various texts in keeping with an overriding theme. 4. write an analytically coherent essay, built around an explicitly stated thesis.

Elective courses which link to the cluster: Assessment of Emerging Technologies, Shaping Technology and Use, Technology, Globalization and the Environment

Description MASTERLAB

Course name	MasterLab 1			**Course code**	
Participating programme	PSTS			**Phase/ Study period**	M2, 1A & 1B
Credits	5.0	**Language**	English	**Obligatory/ elective**	Obligatory
Teaching staff	Verbeek, Soraker, Konrad				
Study material	Academic articles and cases (provided on Blackboard), student presentations and participating in research group activities.				
Subjects, theories and models	Understanding relations between courses within profiles by finding cases related to profiles and applying theories/methods to cases. Acquiring more specialized research skills in order to read and write specialized papers. Participating in research group activities. Group project Master's theses; (Presenting) Thesis Proposal				
Teaching methods	seminar setting				
Examination and assessment	The assessment is based on active involvement in the sessions and collective discussions (has to be sufficient), a case study and a thesis proposal (presentation and paper).				
Learning objectives	This course connects to the final qualifications K4, K5, K6, S4-S9 of the programme, according to the following learning objectives: At the end of the course the student has knowledge of or insight in: 1. the relation between topics within his/her profile 2. the state of the art research lines within his/her profile At the end of the course the student is able to: 3. conduct own project within a profile of PSTS, which has to result in a thesis proposal.				

Course name	MasterLab 2			**Course code**	
Participating programme	PSTS			**Phase/ Study period**	M2, 1A & 2B
Credits		**Language**	English	**Obligatory/ elective**	Obligatory
Teaching staff	Verbeek, Soraker, Konrad				
Study material	Concepts of theses and presentations of fellow students; participating in research group activities.				
Subjects, theories and models	Master's theses meetings (one afternoon in two weeks) (EC's: is part of the Master's thesis)				
Teaching methods	seminar setting				
Examination and assessment	The assessment is based on active involvement in the sessions and collective discussions (has to be sufficient).				
Learning objectives	This course connects to the final qualifications K4, K5, K6, S4-S10 of the programme, according to the following learning objectives: At the end of the course the student has knowledge of or insight in: 1. a broader framework in which he/she can localize his/her thesis At the end of the course the student is able to: 1. communicate his/her research steps and results to colleagues 2. reflect on the appropriateness of chosen research steps, possible alternatives, and change course, if necessary 3. provide appropriate feedback to colleagues				

	link his/her thesis work to application areas within or outside academia