
UNIT 1 INTRODUCTION AND OVERVIEW OF THE COURSE

Contents

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Historical Developments
- 1.3 Different Fields of Philosophy of Technology
- 1.4 The Relationship between Technology and Science
- 1.5 Ethical and Social Aspects of Technology
- 1.6 Philosophizing as a Search
- 1.7 Course overview and the Rationale
- 1.8 Let Us Sum Up
- 1.9 Key Words
- 1.10 Further Readings and References

1.0 OBJECTIVES

- To have an introduction and over-all perspective of philosophy of technology.
- To see the larger implications of technology and philosophy of technology.
- To see the relationship between science and technology

1.1 INTRODUCTION

If philosophy is the attempt “to understand how things in the broadest possible sense of the term hang together in the broadest possible sense of the term”, (Sellars 1962), philosophy should not and cannot ignore technology. It is largely by technology that contemporary society hangs together. It is hugely important not only as an economic force but also as a cultural force. During the last two centuries, much philosophy of technology has been concerned with the impact of technology on society (Franssen, Lokhorst and van de Poel 2011). This unit starts with a brief historical overview, then presents an introduction to the modern philosophy of technology, and ends with a discussion of the societal and ethical aspects of technology. Then we see the course outline and its rationale.

1.2 HISTORICAL DEVELOPMENTS

It may be claimed that philosophical reflection on technology is about as old as philosophy itself. It started in ancient Greece. One early theme is the thesis that technology learns from or imitates nature (Plato). According to Democritus, for example, house-building and weaving were first invented by imitating swallows and spiders building their nests and nets, respectively. Aristotle referred to this tradition by repeating Democritus’ examples, but he did not maintain that technology can only imitate nature: “generally art in some cases completes what nature cannot bring to a finish, and in others imitates nature” (Franssen, Lokhorst and van de Poel 2011)

Another theme related to philosophy of nature is the claim that there is a fundamental ontological distinction between natural things and artifacts. According to Aristotle the former have their principles of generation and motion inside, whereas the latter, insofar as they are artifacts, are generated only by outward causes, namely human aims and forms in the human soul. Natural products (animals and their parts, plants, and the four elements) move, grow, change, and reproduce themselves by inner final causes; they are driven by purposes of nature. Artifacts, on the other hand, cannot reproduce themselves. Without human care and intervention, they vanish after some time by losing their artificial forms and decomposing into (natural) materials. For instance, if a wooden bed is buried, it decomposes to earth or changes back into its botanical nature by putting forth a shoot. The thesis that there is a fundamental difference between man-made products and natural substances had a long-lasting influence. In the Middle Ages, Avicenna criticized alchemy on the ground that it can never produce ‘genuine’ substances. Even today, some still maintain that there is a difference between, for example, natural and synthetic vitamin C. Aristotle’s doctrine of the four causes—material, formal, efficient and final—can be regarded as a third early contribution to the philosophy of technology. Aristotle explained this doctrine by referring to technical artifacts such as houses and statues (Wikipedia)

A final point that deserves mentioning is the extensive employment of technological images by Plato and Aristotle. In his “Timaeus,” Plato described the world as the work of an Artisan, the Demiurge. His account of the details of creation is full of images drawn from carpentry, weaving, modelling, metallurgy, and agricultural technology. Aristotle used comparisons drawn from the arts and crafts to illustrate how final causes are at work in natural processes. Despite their criticism of the life led by merely human artisans, both Plato and Aristotle found technological imagery indispensable for expressing their belief in the rational design of the universe. Considered under the rubric of the Greek term *techne* (art, or craft knowledge), the philosophy of technology goes to the very roots of Western philosophy. In his “Republic,” Plato sees *techne* as the basis for the philosophers’ proper rule in the city. In the “Nicomachean Ethics,” Aristotle describes *techne* as one of the four ways that we can know about the world. The Stoics argued that virtue is a kind of *techne* based upon a proper understanding of the universe.

Some prominent 20th century philosophers to directly address the effects of modern technology on humanity were John Dewey, Martin Heidegger, Herbert Marcuse, Günther Anders and Hannah Arendt. They all saw technology as central to modern life, although Heidegger, Anders, Arendt and Marcuse were more ambivalent and critical than Dewey. The problem for Heidegger was the hidden nature of technology’s essence, *Gestell* or Enframing which poised for humans what he called its greatest danger thus its greatest possibility. Heidegger’s major work on technology is found in “The Question Concerning Technology.” He argues that technology is not just a tool used by humans but it has become an overarching frame, which essentially makes up humans.

1.3 DIFFERENT FIELDS OF PHILOSOPHY OF TECHNOLOGY

The vast field of philosophy of technology can treat any or all of the following areas of study.

- Critique of technology
- Ethics of technology
- History of technology
- Industrial sociology
- Philosophy of engineering
- Technological evolution
- Theories of technology
- Analytic Philosophy of Technology

These different fields of study give us an idea of the various dimensions of philosophy of technology and its relevance.

Check Your Progress I

Note: Use the space provided for your answers.s.

1) What is “techne”?

2) Give the different fields of philosophy of technology?

1.4 THE RELATIONSHIP BETWEEN TECHNOLOGY AND SCIENCE

The close relationship between the practices of science and technology may easily keep the important differences between the two from view. The predominant position of science in the philosophical perspective did not easily lead to a recognition that technology merited special attention for involving issues that did not emerge in science. This situation is often presented, perhaps somewhat

dramatized, as coming down to a claim that technology is ‘merely’ applied science (Franssen, Lokhorst and van de Poel 2011).

A questioning of the relation between science and technology was the central issue in one of the earliest discussions among analytic philosophers of technology. In 1966, in a special issue of the journal “Technology and Culture,” the Polish Philosopher, Henryk Skolimowski. argued that technology is something quite different from science. As he phrased it, science concerns itself with what is, whereas technology concerns itself with what is to be. A few years later, in his well-known book “The sciences of the artificial” (1969), Herbert Simon, an American political scientist, emphasized this important distinction in almost the same words, stating that the scientist is concerned with how things are but the engineer with how things ought to be. Although it is difficult to imagine that earlier philosophers of science were blind to this difference in orientation, their inclination to view knowledge as a system of statements may have led to a conviction that in technology no knowledge claims play a role that cannot also be found in science.

In the same issue of “Technology and Culture,” Mario Bunge, an Argentine philosopher and physicist, defended the view that technology is applied science, but in a subtle way that does justice to the differences between science and technology. Bunge acknowledges that technology is about action, but an action heavily underpinned by theory—that is what distinguishes technology from the arts and crafts and puts it on a par with science. According to Bunge, theories in technology come in two types: substantive theories, which provide knowledge about the object of action, and operative theories, which are concerned with action itself. The substantive theories of technology are indeed largely applications of scientific theories. The operative theories, in contrast, are not preceded by scientific theories but are born in applied research itself. Thus, as Bunge holds, operative theories show a dependency on science in that in such theories the method of science is employed. (Franssen, Lokhorst and van de Poel 2011).

1.5 ETHICAL AND SOCIAL ASPECTS OF TECHNOLOGY

Neutrality Thesis

It was not until the twentieth century that the development of the ethics of technology as a systematic and more or less independent subdiscipline of philosophy began to take shape. This late development may seem surprising given the large impact that technology has had on society, especially since the industrial revolution (Franssen, Lokhorst and van de Poel 2011).

A plausible reason for this late development of ethics of technology is the instrumental perspective on technology. This perspective implies, basically, a positive ethical assessment of technology: technology increases the possibilities and capabilities of humans, which seems in general desirable. Of course, since antiquity, it has been recognized that the new capabilities may be put to bad use or lead to human hubris. Often, however, these undesirable consequences are attributed to the users of technology, rather than the technology itself, or its developers. This vision is known as the instrumental vision of technology resulting in the so-called neutrality thesis. The neutrality thesis holds that technology is a

neutral instrument that can be put to good or bad use by its users. During the twentieth century, this neutrality thesis met with severe critique, most prominently by Martin Heidegger and Jacques Ellul, who have been mentioned in this context, but also by philosophers from the Frankfurt School (Adorno, Horkheimer, Marcuse, Habermas). Today most philosophers do not subscribe to the neutrality thesis, since technology is not always in itself neutral.

Ethics of Specific Technologies

The last decades have witnessed an increase in ethical inquiries into specific technologies. One of the most visible new fields is probably computer ethics, but biotechnology has spurred dedicated ethical investigations as well. Also more traditional fields like architecture and urban planning have attracted specific ethical attention. More recently, nanotechnology and so-called converging technologies have led to the establishment of what is called nanoethics. Apart from this, there has been a debate over the ethics of nuclear deterrence (Franssen, Lokhorst and van de Poel 2011).

Obviously the establishment of such new fields of ethical reflection is a response to social and technological developments. Still, the question can be asked whether the social demand is best met by establishing new fields of applied ethics. This issue is in fact regularly discussed as new fields emerge. Several authors have, for example argued that there is no need for nanoethics because nanotechnology does not raise any really new ethical issues. The alleged absence of newness here is supported by the claim that the ethical issues raised by nanotechnology are a variation on, and sometimes an intensification of, existing ethical issues, but hardly really new, and by the claim that these issues can be dealt with the existing theories and concepts from moral philosophy. Thus every new technology creates its own specific ethical issues which are usually addressed in philosophy of technology.

Responsibility

Responsibility has always been a central theme in the ethics of technology. The traditional philosophy and ethics of technology, however, tended to discuss responsibility in rather general terms and were rather pessimistic about the possibility of engineers to assume responsibility for the technologies they developed. The French philosopher and law professor, Jacques Ellul, for example, has characterized engineers as the high priests of technology, who cherish technology but cannot steer it. In engineering ethics, the responsibility of engineers is often discussed in relation to code of ethics that articulate specific responsibilities of engineers. Such codes of ethics stress three types of responsibilities of engineers: 1) conducting the profession with integrity and honesty and in a competent way, 2) responsibilities towards employers and clients and 3) responsibility towards the public and society. With respect to the latter, most US codes of ethics maintain that engineers 'should hold paramount the safety, health and welfare of the public'. The larger issue of the responsibility technology has for the human welfare needs to be addressed both generally and in its particular fields. So ethical, social and even legal issues arising out of emerging technologies is definitely part of philosophy of technology.

1.6 PHILOSOPHIZING AS A SEARCH

In this section we briefly try to relate philosophizing and technology. Wolfgang Stegmüller, a German philosopher, distinguishes three different kinds of practising philosophy.

- 1) Philosophy as *Weltanschauung* (world-view). The aim is either to enhance (or replace) religion or at least to give some advice to master the difficulties of life. (Marxism, Existentialism)
- 2) Philosophy as science that aims to acquire theoretical knowledge, either independent on the natural sciences or expending them and approaching a kind of overall view or "*Gesamtschau*" (Brentano, Husserl, Hartmann, Schelers)
- 3) Philosophy as investigation of the fundamentals of the empirical and theoretical sciences (Vienna Circle and analytical philosophy)

Whatever be the view of philosophy we hold, we cannot avoid technology and its overall effects in our philosophising. In this course, our aim is not to study some of the significant technological innovations that contemporary society is facing and to dialogue with them critically and creatively. We believe that some of the emerging technological fields contribute much to the growth of human understanding and philosophical reflection.

In general we may speak of three areas of philosophizing: the self (humanity in general), the world and God (which implies only the Transcending nature of humans is one does not believe in God).

In the overview of this course, we have been trying to see how technology can through light on each of these individual areas of philosophizing. The first unit that we have covered throws further light on the nature of reality. The second one throws light on life in general and human life in particular. The third unit that deals with consciousness and artificial intelligence is an attempt to speak more on individual identity and also on God. Neuroscience and neurotheology, while trying to understand the mysterious nature of the brain, attempts to throw light on our understanding of self and of God. The final unit takes seriously the phenomenon of death which is intrinsic to human beings. Recent claims by technology that it can overcome death radically alters the way humans understand ourselves and God.

Check Your Progress II

Note: Use the space provided for your answers.s.

1) How does Jacques Ellul characterize engineers?

.....

.....

.....

.....

.....

2) Who view philosophy as a *Weltanschauung*?

1.7 COURSE OVERVIEW AND THE RATIONALE

The way we understand the world and ourselves is to a large extent shaped by the world we live in . Or better, our world-view truly shapes our understanding of ourselves and the world. For instance, the static world view of the ancients was radically altered by Newton’s model of the world as a machine. Such an understanding brought about by the scientific discoveries of Newton changed our understanding of humans, world and God also. That is the theme of the first block.

In the last century two of the greatest scientific theories have been the theory of relativity (“the most creative theory”) and the theory of quantum mechanics (“the most successful theory”). Together they have altered radically the way we understand the world: our cosmology. Big Bang Theory, which is intimately connected to these two theories explain the origin of the universe. The very nature of time, space at the macro-world and micro-world that these two theories provide are quite different from the classical view of nature. Even after 100 years of their discoveries we have not really fathomed the depth of these insights regarding the nature of the empirical world.

It is in this background that we have introduced two further theories that furthers our understanding of nature. The theory of chaos and nanotechnology, which we have discussed in the previous block, proposes to us a world quite different from the classical, Newtonian or even Einsteinian worlds. These two theories through different insights into the nature of reality.

For instance the theory of chaos tells us that there is a very close connection between apparent order and chaos. The butterfly effect may point to the fact that some events in the universe may go beyond the principles of causality. The fractal nature of reality tells us that roughness in the world (not the idealisations of the world) is what really counts.

Coming to the nanotechnology, which is the science of building machines at a subatomic level, we have a lot to learn. At that realm, which is far greater than the quantum level, some substances develop different qualities. There will be tremendous revolution in our life-style brought about by nanotechnology in the immediate future. Many of these path-breaking discoveries will have philosophical implications. It changes the way we understand the world. It shatters our old world-view and ushers in a more dynamic and even extremely complex and involved nature of reality, of which we are part of.

The next block, moves from reality to life. The tremendous changes brought about my quantum mechanics (or electronics) in the last thirty years will pale

away in comparison to the changes that will be brought in biotechnology in the next few decades. Quantum mechanics shattered our way of understanding the world. Biotechnology, most probably, will shatter the way we approach life, something much more intimate to us. Such changes will occur in the coming years and that is why this century is called the “century of biotechnology.” The way we feel about life, the respect and dignity we ascribe to it and the way we treat other living beings will be challenged by the latest inventions of biotechnology. Already there are talks about “artificial life” and “artificial cells.” Though they still remain at the theoretical realm, they will have quite significant repercussions on our own lives and on our understanding of life. The danger posed by such technologisation is the commodification of life. The opportunity provided by such technologies is the human ability to enhance life.

This leads us to the third block that deals still more intimate aspects of human life: our own self-identity and self-consciousness. The latest neurological findings will surely throw further light on our self-understanding, consciousness, self-identity and all those aspects that make our human life so unique. Advances in brain studies, it is hoped, will provide solace to many sick people, prevent many neurological sickness and further help us to understand ourselves. Though we are just beginning in the process of understanding our brain, it is hoped, that technological advances will improve and enhance our own self-understanding.

Closely connected with our self-understanding is our understanding of God. There are some news that some scientists have discovered the “God-spot” in the brain or that there are “spiritual neurons.” Even if we do not discover such specific God pointers, we need to appreciate the fact that it is our brain that enables us to approach and accept God. We do not believe that God is an illusion created by God. But we can rightly claim that it is the brain that enables us to experience God. The mystical experiences have a neurological basis and spirituality and the transcendental feeling of being united with the whole cosmos is enabled and stimulated by brain. Therefore, without doubt, our understanding of God will be sharpened by the advances in brain studies. That is the topic that we deal with in the third Block.

The last block deals with death. After dealing with the philosophy of death, we take up some technological marvels that claims that death may be eliminated. They are still tall claims. But many techno-enthusiasts have sold themselves to this idea. So much of money is invested into this kind of death. Though we ought to remain skeptical of such claims, we need to realize the tremendous such an idea can have on the society. The idea that death may be overcome, even when it remains merely an idea all the time, can affect our very understanding and philosophizing.

Finally we talk of the crucial possibilities open to ourselves at this point in history: cosmic extinction or collective extension. Truly humanity can destroy ourselves and the whole of life from our precious planet earth. We have the technological prowess for it. We can also positively enhance life in its totality. We do have the technology for it. At the moment we are at the cross-roads! We can either choose life or death, for ourselves and for the rest of humanity.

1.8 LET US SUM UP

In this unit, after introducing philosophy of technology, we have seen the relationship between science and technology. Then we saw the ethical dimensions of technology. Finally, we saw the rationale of our course.

Check Your Progress III
Note: Use the space provided for your answers.
1) How do you relate philosophizing to technology?
.....
.....
.....
.....
.....
2) How does neuroscience change the way we understand God and ourselves?
.....
.....
.....
.....

1.9 KEY WORDS

- Techne or techné:** As distinguished from episteme, is etymologically derived from the Greek word τέχνη which is often translated as craftsmanship, craft, or art. It is the rational method involved in producing an object or accomplishing a goal or objective. Techne resembles *epistēmē* in the implication of knowledge of principles, although techne differs in that its intent is making or doing, as opposed to “disinterested understanding.”
- Gestell or Enframing:** Gestell (or sometimes Ge-stell) is a German word used by Twentieth century German philosopher Martin Heidegger to describe what lies behind or beneath modern technology. According to him, the essence of technology is Gestell. Indeed, “Gestell, literally ‘framing’, is an all-encompassing view of technology, not as a means to an end, but rather a mode of human existence.”
- Hubris:** In Greek tragedy hubris is excessive pride toward or defiance of the gods, leading to nemesis (destruction and death). This is the danger that humans are all exposed to.

1.10 FURTHER READINGS AND REFERENCES

Arendt, Hannah. *The Human Condition*. 2nd ed. Chicago: University of Chicago Press, 1998.

Ernst Kapp: *Grundlinien einer Philosophie der Technik. Zur Entstehungsgeschichte der Cultur aus neuen Gesichtspunkten* (Braunschweig/Brunswick 1877, Reprint Düsseldorf 1978, Engl. Translation Chicago 1978).

Franssen, Maarten, Lokhorst, Gert-Jan and van de Poel, Ibo, “Philosophy of Technology”, *The Stanford Encyclopedia of Philosophy* (Spring 2010 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/spr2010/entries/technology/>>. Retrieved on August 2, 2011.

Mitcham, C. (1994) *Thinking through technology: the path between engineering and philosophy*. Chicago: University of Chicago Press.

Pandikattu, Kuruvilla “Crucial Challenges and Creative Possibilities of Genetic Biology”. *SatyaNilayam: Chennai Journal of Intercultural Philosophy* (January 2005): 42-59.

Pandikattu, Kuruvilla “Collective Extension or Common Extinction: The Challenge of Being Human Today,” in Augustine Pamplany (ed.), *Rehumanising the Human: Interdisciplinary Essays on Human Person in Context: Festschrift for Dr Jose Panthackal CST, ATC*, Bangalore, 2006, 189-210.

Sellars, W. (1962) *Philosophy and the scientific image of man*. In *Frontiers of science and philosophy*, edited by R. Colodny, Pittsburgh: University of Pittsburgh Press, 35–78.

Wikipedia contributors. “Philosophy of technology.” *Wikipedia, The Free Encyclopedia*. Wikipedia, The Free Encyclopedia, 5 Aug. 2011. Web. 18 Aug. 2011.