

# Science, Technology, and Society (GE 301)

“GEyik”

“GEek”

No well-educated person can be ignorant of the nature of technology and science, and of their drastic influences upon our values, culture, and way of life. Unfortunately, the rigor of science and engineering education leaves little room for reflecting on these matters. This course is designed to initiate students into critical thinking and self education beyond the technical confines of their academic discipline.

Offered since the 1995–1996 academic year and now celebrating its 20th anniversary, GE301 is undergoing revolutionary changes. A move to smaller classes is being undertaken to increase the level of interaction and discussion between instructors and students and improve the quality of assessments, with the goal of increasing learning outcomes. Exams will be predominantly essay type and students will have a chance to work on a term project.

**Instructor** Haldun Özaktas, Electrical Engineering.

**Catalog Description** The purpose of this course is to introduce a variety of views and perspectives on science, technology, and society. Ethical aspects of technology development and responsible practices will be discussed. Students will explore a range of material on the history of technology, relevant social and philosophical approaches, technology and politics, technological controversies, technology and democracy, intellectual property, environmental issues, and developments in health and medicine. Additional special topics will be covered.

## Weekly Syllabus

1. Introduction to Science, Technology and Society
2. History of Technology
3. Technology and Politics
4. Engineering, Ethics and Responsibility
5. Social Studies and Philosophical Perspectives
6. Environmental Issues
7. Health, Medicine and Technology
8. Technological Controversies
9. Technology and Democracy
10. Intellectual Property and Emerging Developments
11. Technology, Innovation and Responsibility
12. Special Topics I
13. Special Topics II
14. Special Topics II

**Web page** Check often:

<http://www.ee.bilkent.edu.tr/~ge301>

This web page is only for sections of Haldun Özaktas. Anything written in this document will be overridden by more recent information posted on the web page or sent by e-mail.

**Registration details** The course is worth 2 units and is required for engineering students.

**Textbooks** Several books and additional materials will be used. The books below are listed in order of likely usage. More material will be used from books near the top of the list, less material will be used from books at the bottom of the list.

L. S. Hjørth, B. A. Eichler, A. S. Khan, and J. A. Morello. *Technology and Society: A Bridge to the 21st Century*, second edition. Prentice-Hall, New Jersey, 2003.

W. M. Evan and M. Manion. *Minding the Machines: Preventing Technological Disasters*. Prentice-Hall, 2002.

T. Easton. *Taking Sides: Clashing Views in Science, Technology, and Society*, eighth edition. McGraw-Hill, 2008.

D. G. Johnson and J.M. Wetmore, Eds. *Technology and Society: Building our Sociotechnical Future*. MIT Press, 2009.

S. Sismondo S. *An Introduction to Science and Technology Studies*. Wiley & Sons, 2010.

R. E. McGinn. *Science, Technology, and Society*. Prentice-Hall, 1991.

**Content** The course consists of (i) lectures and video showings, (ii) compulsory readings or videos, and (iii) optional readings or videos.

It is very important that you stay up-to-date with what is covered in class and the compulsory readings and videos, since this will directly affect your performance during in-class discussions.

**Lectures and video showings** Lecture or video titles will be announced on the web page. You are responsible for the content of these in the exams unless otherwise indicated. It may be a good idea to take notes while listening or watching the presentations, in order to have material to study from. If it is indicated that you are not responsible for them, then a sign-up register will be distributed to check your attendance, but this will be rare.

**Compulsory readings and videos** Compulsory reading material and/or videos will be assigned on a weekly basis on the course web page. You will be responsible for reading that material and/or watching the videos before coming to class that week. If you come to class without reading or watching these materials, this will negatively affect your performance during in-class discussions. The compulsory readings will either be made available on the web page or assigned from the textbooks or other sources.

The exams will measure your mastery of the readings, as well as indicated lectures and videos.

**Optional readings and videos** Some optional readings and videos may be found among the compulsory ones and are clearly indicated as “optional”. Further optional materials are found under the heading “Optional Links” on the web page. You are not responsible from these but they are highly recommended.

**Attendance** If attendance is required that day, you will lose 2 percentage points of your attendance for that day for every minute you come late. Example: If you come 20 minutes late, your attendance for that day will count as 60%. If you come 50 minutes or more late, you will be assumed absent. Naturally, this rule applies only for sessions for which attendance is required, as indicated on the web page. Attendance will be only rarely required.

If you miss more than two events for which attendance is required, a penalty of 1/3 letter grade will be applied for each absence in excess of two. For instance, if you would normally get a B from the course but you have 3 absences, you will get B-. Normally, even medical reports or similar legitimate excuses are not applicable to absences. If you believe you have extremely special circumstances, you may send e-mail and ask.

When attendance is taken, be sure to sign your name on dated and validated sign-up sheets provided by us, not on any other piece of paper.

**Examinations (55% weight)** There will be a midterm and a final. Both exams will cover (i) the compulsory reading materials and (ii) the indicated lectures or videos.

*Midterm Exam* (35% weight): It will include all material up to around two-thirds of the course, and will take place approximately around week 9. The exact coverage and time will be announced. The length of the exam will be between 60-100 minutes. It will contain essay type questions requiring paragraph-length answers and also some short answer questions requiring 1-2 sentence answers. It will be a closed-book exam but students will be able to bring up to two handwritten “cheat sheets” into the exam (details below).

*Final Exam* (20% weight): It will include all material not included in the Midterm, and maybe some material included in the Midterm that will be specified. The format is the same as the Midterm, however the duration may be longer

and the essay questions may involve more extended writing.

*Cheat sheet rules:* The sheet(s) must be standard lined or unlined white A4 paper. Both sides can be used. Two sheets means two pieces of paper, for a total of 4 pages when both sides are used. It must be written in the student's own handwriting on both sides, with any kind of pen or pencil, but not have anything whatsoever printed on them (including any and all forms or reproduction or copying other than direct handwriting). It must be handed in along with the exam so if it is precious to you, make a copy for yourself to retain and hand in the original.

Students may also bring a paper (not electronic) dictionary into the exams.

No other materials other than pencils, pens, erasers, sharpeners and a bottle of water are allowed. Sharing any materials during the exam is strictly prohibited. In particular you will not be allowed to share books, notes, dictionaries, paper, pens, pencils, erasers, pencil sharpeners, or other mechanical or electronic tools or equipment. In fact, you are not allowed to have any electronic equipment with you; if you have them, keep them deep inside your bags or coats to prevent misunderstandings. Watches with no additional functionality in addition to showing the date and time are allowed.

If you have a medical report or similar documents approved by the University, photocopies of official reports and permissions must be turned in to the assistant designated for this purpose. Making every effort not to be ill or having an accident during the exams will be to your advantage.

**Term Project (30% weight)** In the term project, you will explore a technological development, issue, or controversy using what you have learned in the course. You will prepare a written report complete with sources. Further details about the project will be provided later.

**Participation (15% weight)** Participation will be measured through your contributions to classroom discussions and/or quizzes.

When the class is asked for contributions, you may raise your hand and if prompted by the instructor, tell the class what you have to say. You may respond, debate, refute, support, or add to what the instructor or a classmate said or, when appropriate, raise a new issue. Normally you should speak for not more than one minute, unless the instructor encourages you to continue. Try to be very concise and to the point. For instance, you may begin with one topic or thesis statement, and support it with a few details. You may or may not prepare what you want to say by writing it on a piece of paper. It is acceptable to read if you feel more comfortable that way but your contribution should account for what has been said before you, so if you prepared it before class, you may need to modify it accordingly.

At the end of each day, you will get points for your overall contribution for that day, which will usually be 0, 1, 2. Occasionally fractional points may be awarded. The standard will be kept high. In many cases you may get 0 points. This does not necessarily mean your contributions were "bad" or "wrong". To get 1 point, your contributions must be tangible and add value to the discussion. In exceptional cases you may get 2 points. It will be wiser to be well prepared and make high-quality contributions, rather than try to make as many contributions as you can. Usually, you will get a second turn on the same day only if there is no one new willing to speak, although there could be exceptions where a follow-up or response is deemed appropriate, or for other reasons. I hope that you do not see getting points as the only purpose of contributing to the discussions. In fact, I suspect that those students who contribute out of intellectual and social motivations will be getting more points, than those contributing merely to get points.

After you finish speaking, please tell your name and last name. Please do not ask how many points you got. How many points will correspond to a "full score" will only be determined at the end of the term. However, around the middle of the term, there will be general feedback in this regard.

Factors that will be taken into account while assigning points include:

1. How prepared you are and how well you have mastered the readings and videos for that day, as well as earlier course material if applicable.
2. How well your contribution is related to, or accounts for what is being actively discussed in class.
3. Your intellectual engagement with the course material and/or issue being discussed.
4. How well you express yourself.

If you have any condition that you believe impedes you from such participation or puts you at a disadvantage (such as a speech disorder or other condition), you may discuss it with me.

Quizzes may also contribute to the participation score. These will either check whether you studied the readings

and watched the videos, or whether you carefully followed the class discussions. Quizzes will always be announced beforehand.

**Grading policy** Several instructors will be teaching GE301. All instructors will be following the same weekly syllabus and catalog description, and administering generally the same type of assessments with similar weights. There may be variations from instructor to instructor, but an effort will be made to keep the workload in terms of the amount of reading and length of assignments comparable.

Students will be graded according to their level of intellectual engagement, knowledge and understanding of ethical issues, social, political, and other dimensions, and their ability to draw on course concepts and overall quality of writing.

Instructors will work in coordination in assigning letter grades to prevent significant disparities among sections taught by different instructors. Each instructor will compute a raw overall course score for each student out of 100. Then, these scores will undergo a normalization that equates the separate means and standard deviations for each instructor's group, to the mean and standard deviation for all students. (Note that the normalization is not between sections, but between instructor's groups.) The normalized scores will be combined into a single list and letter grade thresholds will be determined jointly by all instructors.

**FZ policy** A similar normalization procedure will be used to determine who will be admitted to the final. However, only those assessments administered or with a deadline until 168 hours before the deadline for submitting FZ grades will be included in the total score. If your after-normalization score is at least 35% of the maximum available, you will not get an FZ.

**Office hours** Please try to keep to the announced office hours. The course assistant(s) will be available once a week to help you and answer your questions etc. Please respect their hours as well.

**Criticism and feedback** is most welcome. If you wish, you may write them anonymously.