

CSC360: Issues in Computer Science

Redeemer University College

<sample syllabus>

Instructor: Dr. Derek Schuurman **e-mail:** dschuurman@cs.redeemer.ca

Class Hours: Tuesday and Thursday 12:30-2:45PM in room 224

Textbooks: Sara Baase, *A Gift of Fire: Social, Legal, and Ethical Issues for Computing Technology*, 4th edition, Pearson, 2013.

Derek Schuurman, *Shaping a Digital World: Faith, Culture and Computer Technology*, InterVarsity Academic Press, 2013.

There will also be various additional assigned readings throughout the course.

Course Description: This course is an interdisciplinary study of computer technology through the eyes of faith in which students are required to wrestle with important issues related to the societal impact of computing. Various current technology issues are discussed as they relate to philosophy, theology, ethics and the social sciences. Students will be assigned weekly readings, do research, and actively investigate the issues.

Learning Outcomes: Upon successful completion of this course, a successful student will be able to:

I. Depth and Breadth of Knowledge

- explain a Reformed Christian perspective of computer technology;
- describe and discuss a breadth of issues that arise in computer technology such as privacy, intellectual property, freedom of expression, views on artificial intelligence and the social aspects of computing
- discuss assumptions in different views of technology including instrumentalism, determinism, and technicism

II. Knowledge of Methodologies

- list Dooyeweerd's modal aspects and explain how they can inform design decisions in computer technology
- discuss assumptions and values embedded in hardware and software designs
- explain how technology is not neutral, but value-laden

III. Application of Knowledge

- discuss different types of intellectual property including copyrights and patents and how they apply to digital media
- describe the goals of the open source movement
- discuss the issue of personal privacy including modern threats to privacy and technological solutions to privacy problems
- describe environmental impacts of computer use and disposal (including e-waste)
- list examples of computer crime

IV. Communication Skills

- make presentations describing contemporary computer issues and share a Christian perspective of those issues
- write about issues in computer science and winsomely provide a Christian perspective

V. Awareness of Limits of Knowledge

- describe how the impact of new technology is often difficult to predict
- discuss thorny issues in computer technology and understand the need for humility

VI. Maturity and Professional Capacity

- describe professional codes of ethics in computing (including codes of ethics from the ACM and the IEEE)
- read deeply within the area of computer issues
- develop humility in the face of difficult issues and the limitations of technology
- recognize the ethical responsibility of ensuring software correctness, reliability and safety
- apply normative principles for the use and design of responsible computer technology

Assignments: Attendance in class is required and students are expected to be prepared and actively involved in the discussion. Arrival to class more than 10 minutes late will be considered an absence. Students are required to follow regular weekly readings in preparation for class. A quiz will be given at the beginning of each class to ensure students have completed the readings for that week. There will be 2 major assignments as follows:

1. Each student will be responsible for leading and initiating discussion for one class period surrounding the topic and readings for that week. It is expected that the discussion leader will come prepared to elicit feedback and to promote discussion on the topic for that week. This will involve preparing a 2-page handout which include the following: an abstract of the readings, a summary of the related norms, and a minimum of four discussion questions. Students will be graded based on their summary, discussion questions, and their leadership in guiding class discussion. Students will be evaluated by the professor as well as being evaluated by peers (although the grades will be assigned by the professor).
2. In addition to the required readings, each student must read one book. The book must be chosen from a list of approved books (other books on technology issues may be considered with approval from the instructor). Students must each select distinct books. Each student must write a report and make a presentation to the class on the book they have chosen which will be evaluated by the professor. The report and presentation should provide a thoughtful perspective on the book and identify its philosophical stance also in relation to the norms discussed in class. Each book review will consist of 4 pages which should include an introduction to the author, an outline of the book, its main points and themes, and a thoughtful response to the main themes and topics raised in the book including any related norms.

Note: Pages of submitted material refer to word-processed printed pages using 12pt font(s), double-spaced, with a 9 inch by 6.5 inch body of text per page using Chicago style.

Grading Scheme: The grading scheme will be as follows:

Attendance and class participation	10%
Quizzes on assigned readings	40%
Leading a class with discussion on assigned readings	20%
Book presentation	10%
Book report	20%

Please read the Policy on Academic Integrity found at www.redeemer.ca/academicintegrity. The policy applies to you whether or not you have read it. Any student who violates this policy and commits a breach of academic integrity will be treated in accordance with the policy.

Course Outline: A tentative schedule for the course is shown on the next page along with assigned readings for each week. It is the responsibility of each student to do the readings each week to enable meaningful class discussions. Students are responsible for weekly readings. Quizzes will be given out regularly on the first class of the week and will be based on the assigned readings for that week.

Week	Topics	Readings
1	Introduction to perspectives on technology <ul style="list-style-type: none"> • Technology is not neutral, technology as value-laden • definition of technology and <i>technique</i> • technological instrumentalism and determinism • McLuhan: “medium is the message”; four laws of media 	<i>Shaping a Digital World</i> , chapter 1 H. Nissenbaum, "How Computer Systems Embody Values" , <i>IEEE Computer</i> , Mar. 2001, 120, 118-119.
2	A Biblical perspective on computer technology <ul style="list-style-type: none"> • Different approaches to faith and technology • technology and the unfolding of creation • computer technology and the fall • responsible computer technology; design norms • technology and the future 	<i>Shaping a Digital World</i> , chapters 2, 3
3	How digital technology shapes us Movie: <i>Out of Print</i>	Nicholas Carr, "Is Google Making Us Stupid?" <i>The Atlantic</i> , July/Aug 2008. Neil Postman: "Five Things We Need to Know About Technological Change" <i>Shaping a Digital World</i> , chapter 4
4	Privacy and Personal Information <ul style="list-style-type: none"> • Data collection, “Big Data” and data mining, government surveillance, biometrics • Cryptography, steganography • Freedom of Speech, content filtering 	<i>A Gift of Fire</i> , chapters 2, 3
5	Intellectual Property Issues <ul style="list-style-type: none"> • Copyrights and Patents • The Open Source movement, the free-software philosophy Movie: <i>Revolution OS</i>	<i>A Gift of Fire</i> , chapter 4 Eric Raymond, "The Cathedral and the Bazaar"
6	Computer Crime <ul style="list-style-type: none"> • Software piracy • Computer viruses and worms, hackers, online scams Avi Rubin: "All your devices can be hacked"	<i>A Gift of Fire</i> , chapter 5
7	Computers and Work <ul style="list-style-type: none"> • Job losses and gains, changing skills, tele-working, employee monitoring • hyperemployment 	<i>A Gift of Fire</i> , chapter 6 Nicolas Carr, "All Can Be Lost: The Risk of Putting Our Knowledge in the Hands of Machines" , <i>The Atlantic</i> , Nov. 2013.

8	<p>Artificial Intelligence (AI)</p> <ul style="list-style-type: none"> Weak vs. Strong AI, Consciousness, “Turing Test,” the “singularity” Transhumanism 	<p><i>Shaping a Digital World</i>, pp. 48-52, and chapter 5</p> <p><i>A Gift of Fire</i>, pages 347-350.</p> <p>Searle, John R. “Minds, Brains and Programs.” <i>Behavioral and Brain Sciences</i> 3, no. 3 (1980): 417-57. (Preprint version available online)</p>
9	<p>Reliability and Safety issues</p> <ul style="list-style-type: none"> the Therac-25 incident <p>Professional Ethics and Responsibilities</p>	<p><i>A Gift of Fire</i>, pp. 362-392, 404-412, Appendix A</p>
10	<p>Robotics and ethics (Robo-ethics)</p> <ul style="list-style-type: none"> autonomous lethal robots child care robots elder care robots robot companions <p>Video: Meet the robots for humanity</p>	<p>Sharkey, N.E. (2008) “The Ethical Frontiers of Robotics”, <i>Science</i>, 322.</p> <p>Weiss, Lora G. “Autonomous Robots in the Fog of War”, <i>IEEE Spectrum</i> 48, no. 8 (August 2011).</p> <p>Sharkey, A. and N. Sharkey. “Children, the Elderly, and Interactive Robots.” <i>Robotics and Automation Magazine</i>, (March 2011) (on reserve).</p>
11	<p>Alone Together: How digital devices and social networking shape human connection and communication</p> <p>Video: <i>Connected, but alone?</i> (Sherry Turkle)</p>	<p>Sherry Turkle, “Always-on/Always-on-you: The Tethered Self”, In <i>Handbook of Mobile Communication Studies</i>, Cambridge, MA: MIT Press, 2008.</p> <p><i>Shaping a Digital World</i>, Chapter 6</p>
12 and 13	Student Presentations	

Partial List of Approved Books for Book Report Option

- Baker, Stephen. *The Numerati*. Houghton Mifflin Harcourt, 2008.
- Basden, A. *Philosophical Frameworks for Understanding Information Systems*. IGI Global, 2007.
- Carr, Nicholas. *The Shallows*. W. W. Norton & Company, 2010.
- Challies, Tim, *The Next Story: Life and Faith after the Digital Explosion*, Zondervan, 2011.
- Dyer, John, *From the Garden to the City*, Kregel Publications, 2011.
- Ellul, Jacques. *The Technological Society*. Vintage Books, 1964.
- Grant, George. *Technology and Justice*. Anansi, 1986.
- Hipps, Shane. *Flickering Pixels*. Zondervan, 2009.
- Kallenberg, Brad, *God and Gadgets: Following Jesus in a Technological Age*, Cascade Books 2011.
- Lanier, Jaron. *You are Not a Gadget*. Alfred A. Knopf, 2010.
- Margolis, Jane. *Stuck in the Shallow End: Education, Race, and Computing*. MIT Press, 2010.
- McLuhan, Marshall, *Understanding Media*, MIT Press, 1994.
- Mitcham, Carl. *Thinking Through Technology: The Path Between Engineering and Philosophy*. University of Chicago Press, 1994.
- Monsma, Stephen V., ed. *Responsible Technology*. Eerdman's Publishing Company, 1986.
- Postman, Neil. *Amusing Ourselves to Death: Public Discourse in the Age of Show Business*. Penguin, 1986.
- Postman, Neil. *Technopoly: The Surrender of Culture to Technology*. Vintage Books, 1993.
- Robinson, Brett, *Appletopia*, Baylor University Press, 2013.
- Schultze, Quentin J. *Habits of the High-Tech Heart: Living Virtuously in the Information Age*. Baker Academic, 2002.
- Schuurman, Egbert. *Faith and Hope in Technology*. Clements Publishing, 2003.
- Schuurman, Egbert, *Technology and the Future: A Philosophical Challenge*. Toronto: Wedge Publishing, 1980
- Schuurman, Egbert, *The Technological World Picture and an Ethics of Responsibility*. Dordt College Press, 2005.
- Singer, P. W. *Wired for War: The Robotics Revolution and Conflict in the 21st Century*. Penguin Press, 2009.
- Small, Gary. *iBrain: Surviving the Technological Alteration of the Modern Mind*. William Morrow, 2008.
- Solove, Daniel J. , *Nothing to Hide: The False Tradeoff between Privacy and Security*. Yale University Press, 2011.
- Soojung, Alex and Kim Pang, *The Distraction Addiction*, Little, Brown and Company, 2013.
- Turkle, Sherry. *Alone Together: Why We Expect More from Technology and Less from Each Other*. Basic Books, 2011.
- Weizenbaum, Joseph. *Computer Power and Human Reason: From Judgment To Calculation*. W.H. Freeman & Company, 1976.