

## ERS 102 - SUSTAINABILITY AND THE REALLY LONG VIEW (Winter 2020)

**Lectures:** 2:30-4:20 Mondays in EV3-1408

**Tutorials:** Tut 101: 4:30-5:30 Mondays in HH 119

Tut 102: 4:30-5:30 Mondays in HH 259

Tut 103: 8:30-9:30 Tuesdays in HH 345

Tut 104: 8:30-9:30 Tuesdays in HH 124

Tut 105: 11:30-12:30 Tuesdays in HH 259

Tut 106: 11:30-12:30 Tuesdays in HH 124

Tutorials teach practical skills that may require the use of a computer. If you have a laptop, or tablet computer, please bring it to tutorials.

**Instructor:** Dr. Barbara Jane Davy

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Office hours: Mondays, 1-2 pm

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**Teaching Assistants:** TBA

### QUEST SUMMARY

Focusing on the relationship between complexity and energy in bio-physical, ecological and social contexts, we review trends in 'Big History' as it has unfolded from the Big Bang to the Internet, and everything in between. The course explores the implications of this 'deep-time' perspective for our understanding of the great challenge of sustainability.

### OVERVIEW

This core course in SERS situates student learning about environmental issues in the long-term context of the emergence of life, evolution, and the developments of human societies. ERS 102 gives a big picture view linking knowledge from the physical sciences with social scientific perspectives, integrating a complex systems understanding of the ongoing evolution of the universe. This complements the focus on cultural developments and the history of the conservation and the environmental movement in the West covered by Sustainability Thought (ERS 310).

### REQUIRED TEXTS

Harari, Y. (2014). *Sapiens: A Brief History of Humankind*. Signal (McClelland & Stewart). ISBN 9780771038518

Christian, D. (2011). *Maps of Time: An Introduction to Big History*. Berkeley: University of California Press. ISBN 9780520271449

Selected videos from [The Big History Project](#).

Selected readings posted on Waterloo LEARN or available electronically through the library.

*Maps of Time* and *Sapiens* are to be available for purchase at the university bookstore, but you may be able to find used copies.

Students will need to **sign up for a free membership with The Big History Project** online to access the required videos for this course:

<https://www.bighistoryproject.com/home>

### RECOMMENDED TEXTS

- McNeill, J. R. & McNeill William H. (2003). *The Human Web: A Bird's Eye View of World History*. New York: W. W. Norton & Company.
- Bryson, B. (2008). *A Really Short History of Nearly Everything* (Abridged and illustrated ed.). Toronto: Doubleday Canada.
- Diamond, J. (2005). *Guns, Germs, and Steel: The Fates of Human Societies*. New York: Norton.

### INTENDED LEARNING OUTCOMES

By the end of this course, students should:

1. Recognize and recall the 8 thresholds of increasing complexity identified in The Big History Project.
2. Summarize the basics of complexity theory in relation to Big History, sustainability, and long-term processes of human development.
3. Identify major events and developments associated with the 8 thresholds.
4. Interpret historical events in the larger context of Big History.
5. Assess the import and limits of Big History for forecasting future trends and developments.
6. Identify links between the thresholds.
7. Interpret successive phases of human developments in relation to changes in ecological/energy regimes, patterns of social and economic organization, and processes of psychological acculturation.
8. Assess the problem of sustainability in terms of reconciling social complexity and ecological integrity.

### EVALUATION

Late submissions may be subject to a deduction of up to 1% (of the total mark for the course) per day. Attendance and participation in tutorials is required for participation marks.

For details on assignments, see Evaluation file on LEARN.

Participation	10%	recorded weekly
Essay plan	10%	due week 4
Infographic	20%	due week 8
Timeline assignment	20%	due week 10
Essay	40%	due week 12

### EXPECTATIONS

Students are expected to complete required readings and/or watch required videos before the lecture and tutorial each week. Students should bring a pen and paper to lectures and tutorials

to be ready to participate. Active learning techniques will be used in lectures and tutorials. Use of cell phones and computers in lectures is discouraged. Turn off notifications on any devices used in lectures and tutorials or set them to silent mode. Computers or tablets are welcome to be used for designated activities in tutorial sessions.

Differences of opinion are expected in university courses. Respect and civil discourse are expected of students when speaking with one another, TAs, and the professor.

## SCHEDULE OF LECTURES

### PART I: Big History: An Introduction

#### 1. Introduction and Overview

To be shown in class:

David Christian TED Talk: [The History of Our World in 18 Minutes.](#)

### PART II: The Physical Universe: Complexity and the Cosmos

#### 2. Cosmogenesis

Before class:

Watch: [Big History Project](#), Chapter 1 “The Universe” (6 short videos, totalling 50 min),  
Big History Project, Chapter 2 “Our Solar System and the Earth” (3 videos, totalling 43 min)

Read: David Christian, Introduction, chapters 1-3 in *Maps of Time* pp. 1-75.

Optional Readings / Additional Resources:

Fred Spier (2011) “Introduction to Big History”, “Cosmic Evolution: The Emergence of Simple Forms of Complexity” in *Big History and the Future of Humanity* [on LEARN]

Harari, chapters 14-15, pp. 247-304.

Quilley, S., & Loyal, S. (2005). Eliasian Sociology as a ‘Central Theory’ for the Human Sciences. *Current Sociology*, 53(5), 807–828.

<https://doi.org/10.1177/0011392105055021>

Elias, N. (1956). “Problems of involvement and detachment” *British Journal of Sociology*, 7(3): 226-252.

Elias, N. (2007 [1987]) *Involvement and Detachment*. Dublin: UCD Press.

### PART III: The Living Universe

#### 3. The Emergence of Life and Evolution

Before class:

Watch: [Big History Project](#), Chapter 3 “Life on Earth” (6 short videos, totalling 71 minutes)

Read: Christian, Chapters 4-5 pp. 79-136.

#### Optional Readings/ Additional Resources

Spier, "Life on Earth: The Widening Range of Complexity" in *Big History and the Future of Humanity*. [Library]

#### **4. Energy and Complexity**

Essay plan assignment due this week

##### Before Class:

Read: Burzillo, D. "Thresholds" summary [on LEARN]

Rachel Nuwer. (2017). 'How western civilization could collapse' BBC Futures

<https://www.bbc.com/future/article/20170418-how-western-civilisation-could-collapse>

Tainter, J. (2011). Energy, complexity, and sustainability: A historical perspective. *Environmental Innovation and Societal Transitions*, 1(1), 89-95.

Chiasson, E.J. (2005). "Follow the Energy: Relevance of Cosmic Evolution to Human History" *Historically Speaking: Journal of Historical Society*, 6.5: 26.

#### Optional Readings/ Additional Resources

Quilley, S. (2011). "Entropy, the anthroposphere and the ecology of civilization: An essay on the problem of 'liberalism in one village' in the long view." *Sociological Review*, 59(Supp.1), 6590.

### PART IV: *The Cognitive Revolution and the Anthroposphere*

#### **5. Changes in Livelihood and the Material Bases of Social Structures**

##### Before Class:

Watch: [Big History Project](#), Chapter 4 "Humans" (6 short videos, totalling 59 min)

Read: Goudsblom, J. (2012). "Energy and Civilization" *International Review of Sociology* 22.3: 405-411, <http://dx.doi.org/10.1080/03906701.2012.753780>.

#### Optional Readings/ Additional Resources

Barber, Elizabeth Wayland. (1994). "The String Revolution" in *Women's Work: The First 20,000 Years*. New York: W.W. Norton & Company. pp. 42-70.

Quilley, S., & Loyal, S. (2005). Eliasian Sociology as a 'Central Theory' for the Human Sciences. *Current Sociology*, 53(5), 807-828.

<https://doi.org/10.1177/0011392105055021>.

Mennell, S. (1992). "Involvement and Detachment: A Theory of Knowledge and the Sciences" in *Norbert Elias: An Introduction*. Oxford, UK: Blackwell. [on LEARN]

Elias, N. (1978). "Human Interdependencies – Problems of Social Bonds" in *What is Sociology?* London: Hutchinson. pp. 134-157. [on LEARN]

Goudsblom, J. & B. De Vries, eds. (2000). "Introduction: The Expanding Anthroposphere" in *Mappae Mundi: Humans and Their Habitats in Long-Term Socio-Economic Perspective*. Amsterdam University Press. pp. 15-46. [on LEARN]

Pyne, S. J. Selections from *Fire: A Brief History* [on LEARN]  
Goudsblom, J. (1992). *Fire and Civilization*. London: Allen Lane.

## 6. Collective Learning

### Before Class:

Read: Harari “Part One” pp. 1-74.

Christian, use index of *Maps of Time* to find and read pages referencing “collective learning.”

### Optional Readings/ Additional Resources

McNeil & McNeil. (2003). “The Human Apprenticeship” in *The Human Web: A Bird’s Eye View of the World*. New York: W.W. Norton. pp. 9-24.

Walter Ong – Use Wikipedia to learn a little more about Ong and his book *Orality and Literacy*.

Elias, N. (1989). *The Symbol Theory*. UCD Press.

## 7. Domestication and Agrarianization

### Before Class:

Read: Harari, *Sapiens*, Part Two, pp. 77-159.

Christian, D. Chapters 8-10, pp. 207-332.

### Optional Readings/ Additional Resources

Lien, M., H. Swanson & G. Ween. 2018. “Introduction” *Domestication Gone Wild: Politics and Practices of Multispecies Relations*. Durham: Duke University Press. pp. 1-32.

McNeil & McNeil. 2003. “Shifting to Food Production, 11,000 to 3,000 Years Ago” in *The Human Web: A Bird’s Eye View of the World*. New York: W.W. Norton. pp. 25-40.

Berman, M. (2000). “Politics and Power” in *Wandering God: A Study in Nomadic Spirituality*. SUNY Press. pp. 49-83. [on LEARN]

Eisenberg interview [on LEARN]

Budiansky, S. (1992). “The Species that Came in From the Cold” *The Covenant of the Wild: Why Animals Chose Domestication*. Phoenix. pp. 69-93. [on LEARN]

Budiansky, S. (2000). *The Truth about Dogs*. Viking.

## 8. Disenchantment

### Infographic assignment due this week

### Before Class:

Read: Harari “Part Three” pp. 163-244.

Christian, Chapter 11, pp. 335-363.

### Optional Readings/ Additional Resources

Berman, M. 1981. “The Disenchantment of the World (1)” in *The Re-enchantment of the World*. Ithaca: Cornell University Press. pp. 67-113.

Elias, N. (1956). "Problems of involvement and detachment." *British Journal of Sociology*, 7(3), 226-252.

**PART V: The Juggernaut of Modernity**

## **9. The "Civilizing Process" and Colonization**

### Before Class:

Watch: [Big History Project](#), Chapter 5 "The Modern Revolution and the Future" (6 short videos, totalling 54 min)

Read: Harari, Chapters 14-15. pp. 247-304.

Christian, D. Chapter 12, pp. 364-405.

### Optional Readings/ Additional Resources

Dussel, E. (1998). "Beyond Eurocentrism: The World-System and the Limits of Modernity" in *The Cultures of Globalization*. Eds F. Jameson & M. Miyoshi. Durham: Duke University Press. pp. 3-31. [on LEARN]

McNeill, J.R. & W.H. McNeill. 2003. "Spinning the Worldwide Web, 1450-1800" and "Breaking Old Chains, Tightening the New Web" in *The Human Web: A Bird'-Eye View of World History*. New York: W.W. Norton & Company. pp. 155-267.

Lawson, T.T. Review of *Guns, Germs, and Steel* [on LEARN]

Diamond, J. (1997). *Guns, Germs, and Steel*. New York: Norton.

YouTube videos on Jared Diamond's *Guns, Germs, and Steel*:

<https://www.youtube.com/watch?v=JEYh5WACqEk>

<https://www.youtube.com/watch?v=wOmjnioNulo>

Mennell, S. (1992). *Norbert Elias: An introduction*. Oxford, UK: Blackwell.

## **10. Modernization and Individualization**

### Timeline assignment due this week

### Before Class:

Read: Harari, Chapters 18-19, pp. 350-396.

Weiner, M.S. (2013). "The Paradox of Individualism" *The Chronicle of Higher Education*. 59.30.

Quilley, S. (2018). "Relearning: Education for the survival of the species and the planet: Residential schools were designed quite explicitly to obliterate the passing down of local, traditional culture entirely" *Alternatives Journal* 43.3-4.

### Optional Readings/ Additional Resources

Gellner, E. (1983). *Nations and Nationalism*. Oxford: Blackwell.

Weiner, M. (2013). *The Rule of the Clan: What an Ancient Form of Social Organization Reveals About the Future of Individual Freedom*. New York: Farrar, Straus and Giroux.

## 11. Planetary Boundaries and Environmental Consciousness

### Before Class

Christian, Chapters 13-15, pp. 406-491.

Turner, G. & C. Alexander. (2014). "Limits to growth was right. New Research Shows We're Nearing Collapse" *The Guardian*.

<https://www.theguardian.com/commentisfree/2014/sep/02/limits-to-growth-was-right-new-research-shows-were-nearing-collapse>

### Optional Readings/ Additional Resources

Turner, G. (2014). "Is Global Collapse Imminent: An Updated Comparison of *The Limits to Growth* with Historical Data.

[https://sustainable.unimelb.edu.au/\\_data/assets/pdf\\_file/0005/2763500/MSSI-ResearchPaper-4\\_Turner\\_2014.pdf](https://sustainable.unimelb.edu.au/_data/assets/pdf_file/0005/2763500/MSSI-ResearchPaper-4_Turner_2014.pdf)

Watch: Interview with Graham Turner: <https://permaculturenews.org/2015/09/15/my-interview-with-graham-turner-on-limits-to-growth/>

Tim Morgan (2013) *A Perfect Storm. Energy Finance and the End of Growth*.

<https://ftalphaville-cdn.ft.com/wp-content/uploads/2013/01/Perfect-Storm-LR.pdf?mhq5j=e6>

Rockström, J, et al. (2009). "Planetary Boundaries: Exploring the Safe Operating Space for Humanity" *Ecology and Society*. 14.1: 32.

<https://www.ecologyandsociety.org/vol14/iss2/art32/>

Quilley, S. (2012). "System Innovation and a New 'Great Transformation': Re-embedding Economic Life in the Context of 'De-Growth'." *Journal of Social Entrepreneurship*, 3.2: 206-229.

## 12. Resistance, Resilience, and Regenerating Meaning

### Before class:

Berry, T. & B. Swimme. (1992). "Introduction" and "Prologue: The Story" in *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Era – A Celebration of the Unfolding of the Cosmos*. New York: Harper San Francisco.

Sideris, L.H. (2019). "Wonder Sustained: A Reply to Critics" *Zygon* 54.2: 426-453.

[https://journals-scholarsportal-info.proxy.lib.uwaterloo.ca/pdf/05912385/v54i0002/426\\_wsartc.xml](https://journals-scholarsportal-info.proxy.lib.uwaterloo.ca/pdf/05912385/v54i0002/426_wsartc.xml)

### Optional Readings/ Additional Resources

Sideris, L.H. (2017). *Consecrating Science: Wonder, Knowledge, and the Natural World*. Oakland: University of California Press.

Chaisson, E.J. (2001) *Cosmic Evolution: The Rise of Complexity in Nature*. Cambridge, MA, Harvard University Press.

Davies, P. (2006). *The Goldilocks Enigma*. London: Allen Lane.

## COURSE POLICIES

### **Intellectual Property:**

Students should be aware that this course contains the intellectual property of their instructor, TAs, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance students' educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

**Academic Integrity:** In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. Students who are unsure what constitutes an academic offence are requested to visit the on-line tutorial at: <http://www.lib.uwaterloo.ca/ait/>.

**Grievance:** A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, [www.adm.uwaterloo.ca/infosec/Policies/policy70.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm). When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.

**Discipline:** A student is expected to know what constitutes academic integrity [check <https://uwaterloo.ca/academic-integrity/integrity-students>] to avoid committing an academic



offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline, [www.adm.uwaterloo.ca/infosec/Policies/policy71.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm). For typical penalties check Guidelines for the Assessment of Penalties, [www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm](http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm).

**Appeals:** A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) [www.adm.uwaterloo.ca/infosec/Policies/policy72.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm).

**Absences:** Students with an illness, or other emergency, that prevents them from handing in an assignment on time or attending a test, must contact your TA to notify them of this problem prior to the deadline or test date (or as soon afterwards as is reasonably possible). Students with an illness must document evidence of that illness with a note from a doctor. For other emergencies, such as the death of a family member, students should meet with their TA as soon as possible in order to make arrangements to make up any missed assignment or test. Any questions or concerns that you have regarding these matters should be directed to the Department Chair or Associate Chair.

- Please inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

**AccessAbility Services**, located in Needles Hall, Room 1401, is the University’s centralized office for the management of academic accommodations for all students with disabilities. The term ‘disability’ covers a broad range and degree of conditions that can be permanent, temporary, episodic, and suspected, including temporary disabilities, chronic conditions, disabling illness, as well as the physical, emotional, and psychological effects of a trauma (e.g., sexual violence). They collaborate with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

**Campus Wellness** provides counselling services and other mental health support resources for students.

**Mental Health:** The University of Waterloo, the Faculty of Environment and our Departments/Schools consider students' well-being to be extremely important. We recognize that throughout the term students may face health challenges - physical and / or emotional.

**Please note that help is available.**

Mental health is a serious issue for everyone and can affect your ability to do your best work. Counselling Services <http://www.uwaterloo.ca/counselling-services> is an inclusive, non-judgmental, and confidential space for anyone to seek support. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and much more.

**Communications with Instructor and Teaching Assistants:**

All communication with students must be through either the student's University of Waterloo email account or via LEARN. If a student emails the instructor or TA from a personal account they will be requested to resend the email using their personal University of Waterloo email account.

**Recording lectures:**

Use of recording devices during lectures **is only allowed with explicit permission of the instructor of the course.** If allowed, video recordings may only include images of the instructor and not fellow classmates. Posting of videos or links to the video to any website, including but not limited to social media sites such as: Facebook, Twitter, etc., is strictly prohibited.