



ERS 475, 675: Metal and Civilization

Overview

The exploitation of metals has transformed every aspect of human culture, from religious totems and weaponry, to cooking, currency and transportation. Most manufactured objects in the modern world either contain metal of some kind or are manufactured and transported using metal machinery and tools. In this module students will both learn the basics of ironmongery in a fully equipped artisan blacksmith's shop (www.Thak.ca), in nearby Floradale, and explore the significance of metal working in the long-term development of human culture. By experiencing the human skill and energy required to transform and work with iron, students will be given a rare, 'once in a life time' opportunity to combine deep intellectual reflection with raw, tactile experience. Our intention is that, as well as developing real metal working skills, participants will begin to see much more clearly the relationship between energy, the transformation of raw materials and (fragile) social complexity in all human cultures.

The *academic component* will consist of 2 full days of block teaching with a series of preparatory online exercises to be completed through LEARN. Drawing on the work of Norbert Elias and Joop Goudsblom, our exploration will centre on the social, psychological and ecological implications of metallurgy as a process of civilization and an emblematic dimension of the expansion of the anthroposphere within the biosphere. We will use Big History to shed light on metallurgy and social-ecological development in the long view. Other themes will include:

1. *Discovery*: Since most metal ores are not immediately and intuitively useful, how did metal-working develop in the first place?
2. *Class, Economy and Power*: The social implications of large-scale mining (slavery, trade and interdependency)
3. *The Long View*: The relationship between technology and social development through a Big History lens (e.g. the development of currency, use in religion, impacts on culture and the historical ages of metal)
4. *Ecology*: Metallurgy and the biosphere.
5. *Metal and Entropy*: the energy transformations associated with metal working from the Neolithic to the present day

6. *Complex Systems*: rare metals, interdependency and vulnerability in the global economy
7. The *practical element* of the module will involve a two-day, intensive course in basic blacksmithing run by Rob Martin at the THAK blacksmiths in Flordale. Designed to help the beginner develop basic techniques, students will work on both coal and propane forges and make a range of fire tools they can keep and use on their own forge (see <http://www.thak.ca/courses/basic-tool-making/> for further details).

Please note: Absolutely no prior skills are required for full and successful participation in the practical element of this module.

Assessment summary:

- Participation in the practical experience: 30%
- Book Reviews x 2: 20%
- Annotated bibliography 20%
- 1 x 3000 word essay set by the instructors 30%

Instructors: Stephen Quilley and Dan McCarthy

Email: s.quilley@uwaterloo.ca

dan.mccarthy@uwaterloo.ca

Organisation and course fee

- Participation will be selective and by direct application to the instructors. There are only eight or possibly sixteen spaces (if we run the practical twice).
- Enrollment will be in the Spring semester.
- This module requires a course fee \$549 + HST = \$620.37 Total

The fee is payable to ERS Accounts using the ERS course fee form. Do not pay this fee with your tuition.

Key Dates: Spring semester. The practical element will be over a weekend 16th-20th July

This course is part of Environment and Resource Studies' on-going commitment to providing unique and non-traditional educational experiences through our Experiential Learning initiative. <http://elguwaterloo.ca>

Lectures and Course Work:

Assignments and course work schedule

May 20th: Book Review 1 due

June 10th: Book Review 2 due

June 22nd: Annotated Bibliography due

July 15th: In-class session I

July 16th-18th: Practical

July 20th: In-class session II

Aug 20th: Essay Due

In-Class Sessions Summary

Students will be divided into 2 working groups (A and B). The instructions and work tasks below refer to these groups. Please make contact with people in your group at the earliest opportunity. You will be able to do this through LEARN.

	Thursday July 16th	Monday July 20th
9.00- 11.00 am	1. Big History: Metallurgy and Long Term Processes of Social-Ecological Development	4. Craftwork and Modernity
<i>11.00 – 11.30 am</i>	<i>Break</i>	<i>Break</i>
11.30-1.00 pm	2. Social Complexity and Thermodynamics	5. Jared Diamond's 'Guns Germs and Steel' - A close reading
<i>1.00-2.00 pm</i>	<i>Lunch (forage or BYO)</i>	<i>Lunch</i>
2.00-3.30 pm	3. Fire, Civilization and the Triad of Basic Controls	6. Metallurgy and <i>The Knowledge</i>
<i>3.30-3.45pm</i>	<i>Break</i>	<i>Break</i>
3.45-5.00pm	Reflection	Reflection

Assistance for students with disabilities

If you require special assistance, please ensure that I am aware of your needs through the Office for Persons with Disabilities (<http://www.studentservices.uwaterloo.ca/disabilities>).

Plagiarism and academic integrity

You will be held responsible for adhering to UW policy on academic integrity, as outlined in the following guidelines from the office of the Associate Dean of Undergraduate Studies. Plagiarism and other violations of academic integrity will not be tolerated. **This includes the LEARN quizzes**, which must represent your own work. **If you wish to quote material in your assignments, you must place it in quotation marks (or paraphrase it in your own words) and cite the source; otherwise, it would be plagiarism.** If you have any questions about what is appropriate, please come and talk with me. Also examine the following tutorial: <http://www.lib.uwaterloo.ca/ait>.

Academic Integrity: To create and promote a culture of academic integrity, the behaviour of all members of the University of Waterloo is based on honesty, trust, fairness, respect and responsibility.

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, <http://www.adm.uwaterloo.ca/infosec/policies/policy70.html>

Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline, <http://www.adm.uwaterloo.ca/infosec/Policies/policy71.html>

Appeals: A student may appeal the finding and/or penalty in a decision made under Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read Policy 72 - Student Appeals, <http://www.adm.uwaterloo.ca/infosec/Policies/policy72.html>

Turnitin: Plagiarism detection software (Turnitin) will be used to screen assignments in this course. This is being done to verify that use of all materials and sources in assignments is documented.