

**UNIVERSITY OF CALGARY  
FACULTY OF ARTS**

**DEPARTMENT OF GREEK AND ROMAN STUDIES**

Greek and Roman Studies 321

ANCIENT TECHNOLOGY

**Course Outline**

Fall 2013

Instructor: Dr John Humphrey

Office: SS 530; email [humphrey@ucalgary.ca](mailto:humphrey@ucalgary.ca)

Office Hours: MWF 11:00-12:00, or by appointment; email consultation any time

Class Time: MWF 10:00-10:50

Classroom: ST 132

Text: J.W. Humphrey et al. *Greek and Roman Technology: A Sourcebook* (London: Routledge, 1998). Paper.

Essay/Exams: 1. A term paper is worth 40% of the final grade. Topics are to be chosen from the list that follows, or must receive my permission. Essays must be submitted at the beginning of class on the day they are due. I encourage those who have skills in programming, drawing, and model-making to consider a practical project to replace the essay.

2. A midterm test, worth 20% of the final grade, will be based on the readings from the text and on the visual evidence presented in class, for the first half of the term.

3. A two-hour final examination, scheduled by the Registrar during the formal examination period in December (40% of the final grade), will consist of the equivalent of the midterm test, based on the material only from the second half of the course, together with an interpretive essay on a choice of general topics that draw on material for the whole course.

Notes: 1. I encourage you to maintain consultation with me throughout the term, to ask for help when you are floundering or confused, to discuss difficulties with your essays, and to keep me aware of unexpected absences.

2. The withdrawal deadline for this course is Friday 6 December 2013. You can track your current standing in the course through Blackboard. The last day to withdraw from this course with a refund of fees is Friday 20 September 2013.

3. The Department of Greek and Roman Studies draws the attention of all students in its courses to the University regulations on plagiarism, cheating, and other academic misconduct, which can be found in the on-line version of the 2013-2014 University Calendar ([www.ucalgary.ca/pubs/calendar/current/k.html](http://www.ucalgary.ca/pubs/calendar/current/k.html)).

### **Academic Accommodation**

It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 403-220-8237. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than **fourteen (14) days** after the start of the course.

### **Blackboard Help**

Go to <http://www.ucalgary.ca/computersupport/onlineservices/blackboard> for Student Help and FAQs about Blackboard. Troubleshooting tips and a tutorial are available at <http://elearn.ucalgary.ca/blackboard/students>. Instructions for using the Digital Drop Box are available here: [http://library.blackboard.com/docs/r6/6\\_1/student/bbbs\\_r6\\_1\\_student/digital\\_drop\\_box.htm](http://library.blackboard.com/docs/r6/6_1/student/bbbs_r6_1_student/digital_drop_box.htm).

### **Classics Student Society**

Classics Student Society is the Greek and Roman Studies Student Club. For membership or more information please email: [classsoc@ucalgary.ca](mailto:classsoc@ucalgary.ca) or visit <http://grst.ucalgary.ca/undergraduate/classics-students-society>.

### **Faculty of Arts Program Advising and Student Information Resources**

- Have a question, but not sure where to start? The Faculty of Arts Program Information Centre (PIC) is your information resource for everything in Arts! Drop in at SS110, call us at 403-220-3580 or email us at [artsads@ucalgary.ca](mailto:artsads@ucalgary.ca). You can also visit the Faculty of Arts website at <http://arts.ucalgary.ca/undergraduate> which has detailed information on common academic concerns.
- For program planning and advice, contact the Student Success Centre at (403) 220-5881 or visit them on the 3<sup>rd</sup> floor of the Taylor Family Digital Library.
- For registration (add/drop/swap), paying fees and assistance with your Student Centre, contact Enrolment Services at (403) 210-ROCK [7625] or visit them at the MacKimmie Library Block.

### **Student Ombudsperson and Students' Union Representative**

The Student Ombuds Office provides independent, impartial and confidential support for students who require assistance and advice in addressing issues and concerns related to their academic careers. See [www.ucalgary.ca/provost/students/ombuds](http://www.ucalgary.ca/provost/students/ombuds) for more information.

The Students' Union Faculty of Arts representative can be reached at [arts1@ucalgary.ca](mailto:arts1@ucalgary.ca).

### **Emergency Evacuation Assembly Point**

In case of an emergency evacuation during class, students must gather at the designated assembly point nearest to the classroom. The list of assembly points is found at [www.ucalgary.ca/emergencyplan/assemblypoints](http://www.ucalgary.ca/emergencyplan/assemblypoints). Please check this website and note the nearest assembly point for this course.

### **Safewalk**

The Safewalk program provides volunteers to walk students safely to their destination anywhere on campus (including McMahon Stadium, Health Sciences, Student Family Housing, the Alberta Children's Hospital and the University LRT station). This service is free and available to students, staff and campus visitors 24 hrs/day, 365 days a year. Call 403-220-5333 or use one of the Help phones located throughout campus to request a walk.

## Course Schedule

DATE	UNIT	TOPIC	SOURCEBOOK READINGS
Sep 09	Mo	Introduction to the course	
11	We	I Historical outline i: nomads and farmers of the Stone Ages	chapter 1
13	Fr	I Historical outline ii: empires of the Bronze Age	chapter 1
16	Mo	I Historical outline iii: the Greek and Roman Mediterranean	chapter 1
18	We	II Sources of information: archaeology	pages xxii-xxiii
20	Fr	II Sources of information: ancient texts	pages xix-xxi
23	Mo	III Sources of energy, and basic machines in antiquity	chapter 2a-b
25	We	III Hero of Alexandria and mechanical gadgets	chapter 2c
27	Fr	<i>class cancelled; extended office hours</i>	
30	Mo	<i>class cancelled; extended office hours</i>	
Oct 02	We	IV Military technology	chapter 12
04	Fr	V Agriculture i: cultivation and domestication	chapter 3
07	Mo	V Agriculture ii: farms and agricultural tools	chapter 3
09	We	V Agriculture iii: food-processing	chapter 4
11	Fr	V Agriculture iv: diet	chapter 4
14	Mo	VI Hydraulics i: wells and water-lifting devices	chapter 8
16	We	VI Hydraulics ii: water conduction and water conservation	chapter 8
18	Fr	VI Hydraulics iii: urban water systems: Athens and Rome	chapter 8
21	Mo	VII Metals i: mining, metals, and smelting	chapter 5a, 6
23	We	VII Metals ii: casting and fine metalworking	chapter 9a
25	Fr	<b>Midterm test</b>	
28	Mo	VIII Ceramics i: ancient pottery making	chapter 9d
30	We	VIII Ceramics ii: pottery shapes and styles	chapter 9d
Nov 01	Fr	VIII Ceramics iii: glass; an ancient symposium	chapter 9d
04	Mo	VIII Textiles	chapter 9c
06	We	IX Transportation i: ships	chapter 10b
08	Fr	IX Transportation ii: harbours	chapter 10b
11	Mo	IX <i>Reading Day; no classes</i>	
13	We	IX Transportation iii: wheeled vehicles, roads, and bridges	chapter 10a
15	Fr	IX Transportation iv: currency, weights & measures, and trade	chapter 10c
18	Mo	X Time-keeping	chapter 11a
20	We	X Writing i: Bronze-Age scripts: cuneiform and hieroglyphs	chapter 11b
22	Fr	X Writing ii: alphabets: Greek and Latin	chapter 11b
25	Mo	X Writing iii: books and publication	chapter 11b
27	We	XI Construction i: Bronze-Age ziggurats and pyramids	chapter 7
29	Fr	XI Construction ii: Bronze-Age Greek cities and citadels	chapter 7
Dec 02	Mo	XI Construction iii: classical Greek construction	chapter 7
04	We	XI Construction iv: Roman imperial engineering	chapter 7
06	Fr	XII Ancient societies and their attitude to technology	chapter 13

## Some Suggestions for Paper Topics

The following topics have been devised by previous students in this course, and have produced good essays. Use them to suggest variants for your own investigative papers (the topics of which I must approve). Remember that you must email or meet with me to confirm your topic. In parentheses after each topic is the date (always a Monday) on which the essay is due at the beginning of class. Students who choose topics due on or before 28 October are entitled to receive a one-week extension on request; no extensions will be granted to papers due after 28 October.

- The water screw then and now (Oct 14)
- Archimedes and the siege of Syracuse (Nov 25)
- The technology of the ancient theatre (Dec 2)
- Olive processing technology (Oct 7)
- Fossil fuels in antiquity (Oct 28)
- Grain mills in Rome (Oct 7)
- Seismic archaeology and the Mediterranean (Oct 28)
- The power generated by ancient water wheels (Oct 14)
- Roman surveying for slopes (Oct 21)
- The accuracy of ancient sundials (Nov 18)
- Crowd control in the Colosseum (Dec 2)
- Athens' wall of Themistocles (Oct 7)
- Technologies of the ancient Olympic games (Nov 4)
- Assessment of the ancient documentary evidence for military technology (Nov 25)
- Greek and Roman cranes (Dec 2)
- Ancient surgical instruments (Oct 28)
- Family organization revealed by the plan of the Roman house (Dec 2)
- Fire extinguishing in antiquity (Oct 14)
- Evolution of cast bronze weapons (Oct 28)
- The Trojan horse as a siege machine (Oct 21)
- Ancient crossbows (Oct 7)
- Machines for democratic processes (Nov 25)
- Roman surveying instruments (Oct 14)
- Greek cooking utensils (Oct 14)
- Casting large bronze statues (Oct 21)
- Ancient water purity: testing and treatment (Oct 14)
- Elephants in military technology (Nov 25)
- Project management in constructing Roman aqueducts (Oct 21)
- Ancient batteries? (Nov 18)
- Bronze-Age boats (Nov 4)
- The mechanics of retractable theatre canopies (Dec 2)
- Evolution of the plough (Oct 7)
- Ancient perceptions of hygiene (Nov 18)
- Religion and Hero's gadgets (Oct 21)
- Horse equipment (Nov 25)
- The physics of Hero's steam turbine (Oct 7)
- The ancient sling (Nov 4)
- Ancient theatre acoustics (Dec 2)
- Lifting stones for the Parthenon (Dec 2)
- The physics of gears (Oct 7)
- Devices for fastening ancient clothing (Nov 4)
- The ships of the Roman navy (Oct 28)
- Problems in the maintenance of aqueducts (Oct 21)
- Cooling liquids in clay amphorae (Oct 28)
- Roman wine making (Oct 7)
- Horse harnesses and horseshoes (Nov 25)
- Heating water in the Roman baths (Oct 21)
- The invention and use of Greek Fire (Nov 18)
- Principles of harbour design (Nov 4)
- Ecological damage in antiquity (Nov 25)
- The problem of seasonally variable hours (Nov 18)
- The technology of the scroll (Nov 18)
- Racing chariots (Nov 4)
- The evolution of exchange from barter to coinage (Nov 18)

## General Bibliography

Some of the following works are housed in the Reserve Reading Room of the Library, where they are available for consultation and, infrequently, for short-term loan. Copies of the rest are available in the main stacks.

### General Works

J.P. Oleson, ed. *The Oxford Handbook of Engineering and Technology in the Classical World*.

C. Singer et al. *A History of Technology*, vols. 1 and 2.

T.K. Derry and T.I. Williams. *A Short History of Technology from the Earliest Times to A.D. 1900*.

A.P. Usher. *A History of Mechanical Inventions*.

V.G. Childe. *What Happened in History*.

K.D. White. *Greek and Roman Technology*.

R.J. Forbes. *Studies in Ancient Technology*, 9 vols.

L. Sprague de Camp. *The Ancient Engineers*.

H. Hodges. *Technology in the Ancient World*.

J.W. Humphrey. *Ancient Technology*.

### Before the Greeks and Romans

K.P. Oakley. *Man the Toolmaker*.

S. Cole. *The Neolithic Revolution*.

### Classical Antiquity

E. Vermeule. *Greece in the Bronze Age*.

A. Burford. *Craftsmen in the Greek and Roman World*.

C. Mossé. *The Ancient World at Work*.

### Specific Technologies

K.D. White. *Roman Farming*.

J.F. Healy. *Mining and Metallurgy in the Greek and Roman World*.

A.T. Hodge. *Roman Aqueducts and Water Supply*.

L. Casson. *The Ancient Mariners*.

D. Diringer. *Writing*.

J.G. Landels. *Engineering in the Ancient World*.

D. Hill. *A History of Engineering in Classical and Medieval Times*.

### Bibliography

J.P. Oleson. *Bronze-Age, Greek, and Roman Technology: A Selected, Annotated Bibliography*.