Roman Technology, Medicine, and Art

This course investigates a selection of the most famous monuments and cultural institutions of the Roman world in order to understand the technology and engineering that created them, the artistic wonders that decorated them, and their place in the urban context, especially in the city of Rome. As Rome had the largest population of any city in the ancient world, we shall also consider life within it for some more basic concerns—urban health, sanitation, disease, and general quality of daily life for various members of Roman society from slaves to elites. We explore two major primary Latin sources rather carefully (in English) for their wealth of information on Roman thinking about technology, medicine, and art. The first is Pliny the Elder’s *Natural History*. His work is divided into 37 *libri*, or “books,” and was completed, except for finishing touches, in 77 CE. In the preface, dedicated to the Emperor Titus (who became emperor shortly before Pliny’s death during the eruption of Mt. Vesuvius in 79 CE), Pliny the Elder justified his choice of title by explaining his purpose on utilitarian grounds as the study of “the nature of things, that is, life” (“Preface,” 13), hence its usefulness to our course, which also covers the diversity and variety of Roman life. The second primary source, *The Ten Books of Architecture* by the Roman architect and engineer, Marcus Vitruvius Pollio, whose patron was none other than the emperor Augustus, is the only treatise on architecture to have survived, so a crucial guide to Roman building projects. Vitruvius has been regarded since the Renaissance as the first architectural theorist, and his books are the major source on the canon of classical architectural design. He tells us a wealth of information on Greek and Roman buildings, as well as prescriptions for the planning and design of military camps, cities, and structures both large and small from aqueducts, baths, and harbors to machines, measuring devices, and instruments.

With the decline of the ancient world and the loss of the Greek texts on which Pliny and Vitruvius so heavily depended, both the *Natural History* and
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*The Ten Books of Architecture* became substitutes for a general education. In the European Middle Ages many of the larger monastic libraries possessed copies of these works; these and many abridged versions ensured Pliny’s and Vitruvius’ place in European literature. Their authority was unchallenged, partly because of a lack of more reliable information, and partly because their assertions, in many cases, could not be tested.

With Pliny and Vitruvius as our overarching guides (although we shall use other ancient sources as well—to be posted in LATTE), the major monuments of the art and architecture of the Romans are covered in this course, although by no means a full survey and not necessarily in chronological order. Each monument is firmly placed in its historical and cultural context. We consider technologies related to architectural engineering and construction, metallurgy, sculpture, painting, pottery, hydraulics, sea and land transportation, and military machinery and defenses, as well as medical advances. Students are asked to assess the Roman technologies we uncover through the application modern scientific thought and methodology. The chronological dimensions of the course are broad (ca. 5th century BCE to the end of the Roman Empire in 4th century CE, so almost one thousand years of Roman history, with heavy focus on the first to third centuries CE) in order to cover a variety of technological and artistic achievements over a long period of time.

Some of the questions we shall attempt to answer for our primary learning goals are: What needs and desires of the Romans could be fulfilled through their understanding and manipulation of nature? By what standards should we judge the value of natural knowledge systems that appear to bear so little resemblance to modern science? Has technological sophistication historically depended on scientific sophistication, and vice versa? What are the causes of technological change?

**Required Texts:**


**Recommended Texts:**


Most required, recommended, or suggested readings will be posted in LATTE, but you should buy Taylor. Sometimes I shall also place items on RESERVE in the library (indicated with R below).

Some other books from which readings may come:
Main Library - Stacks: T16 .042 1986
Oleson, John Peter, Greek and Roman Mechanical Water-Lifting Devices: the History of Technology, Buffalo, Univ. of Toronto Press, 1984
Main Library - Stacks: TJ840 .044 1984
White, K. D., Greek and Roman Technology, Cornell Univ. Press, 1984
Main Library - Stacks: - + T16 .W45 1984

Course Requirements:
1. Students must be present (in mind and body) and participate as actively as possible during lectures, discussions, and any out-of-class activities or fieldtrips. Questions are always welcome and encouraged. Class attendance will be taken on a regular basis, especially at the beginning of the term so that your professor can get to know you. Each class will have a sign-in sheet for attendance. Please note that it quickly becomes apparent who is present and who is not, especially from the class sign-in sheets.

2. Students must complete all assigned readings (from required texts and from books on reserve or articles posted on LATTE). Appreciation and understanding of lectures and discussions will be greatly enhanced if reading assignments are finished by their due dates. This syllabus contains assignments from your required texts and from various books on the reserve for the semester. Since lectures are original creations, you are advised *not* to miss them. Many points made in them cannot be found in the required or reserve reading. Students will submit one take-home essay midterm exam on Tuesday, March 9. (If you must request an extension, it will only be granted for a valid MEDICAL or other SERIOUS reason, approved by your professor, preferably in ADVANCE.)
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3. Students must also complete a final research paper (which includes a technological or medical assessment), due on April 20, 2017, (7-8 pages for undergraduates and 8-10 pages for graduate students). A full explanation will be forthcoming, but this final project requires a sustained effort to be done well. As a result, you must also write a prospectus for this paper (also graded), which must include a working bibliography, due on Tuesday, March 28. You will have ample opportunities to consult with your professor or our CAs about this project. You will lose one grade step for every day that your prospectus or final paper is late (A+ to A to A- to B+++unless you have a medical or other truly valid excuse, presented IN ADVANCE, if at all possible). The final research paper replaces a final exam. Every student will also present in class about their final paper, some accompanied with a model or other project related to their technology.

Course Requirements with Approximate Grade Determination:
1) Class attendance, class participation, and completion of reading assignments (10%)
2) Midterm Take-Home Essay Exam (due Thurs., March 9) (20%)
3) Prospectus for final paper/ Advance Bibliography (due, Tues., March 28) (20%)
4) Student Presentations (last four classes) (20%)
5) Final Research Paper with technological or medical assessment, 7-8 pages/ 8-10 pages for graduate students (due Thurs., April 20, 2017) (30%)

Total: (100%)

Academic Honesty (last, but hardly least!):
You are expected to be honest in all of your academic work. Brandeis University policy on academic honesty is contained in your Student Handbook in section 5 under “Rights and Responsibilities.” Instances of cheating, plagiarism, or other alleged dishonesty will be reported to the Office of Campus Life for possible referral to the Student Judicial System. The adjudication process is also outlined in your Handbook. Potential consequences of academic dishonesty include (in addition to an “E” on the assignment) failure in the course, disciplinary probation, and suspension from the University. A record of any offense will remain in a student’s disciplinary file in the Office of Student Affairs throughout his or her career at Brandeis. Please know that I take this code very seriously. If you have any questions about my expectations, please ask me.

Lecture topics for the entire semester are listed by date below, along with due dates for assignments, field trips, special events, and special lectures.

Syllabus will be updated as the semester moves on.
Please contact me or one of the CAs if you have questions about the readings.

Course Syllabus and Readings for Semester (subject to some modification):

tues., jan. 17 introduction to the course, readings, and each other assignment: buy books.

thurs., jan. 19 roman life—in city and country from birth to death
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<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
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<tr>
<td>Thurs., Feb. 2</td>
<td>Sanitary Engineering: Baths, Heating, Toilets</td>
<td>Reading: Dobbins and Foss (posted in LATTE) Pt. II, ch 15; Koloski-Ostrow on latrines (posted in LATTE); Vitruvius, Bk. VI.</td>
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<td>Thurs., Feb. 9</td>
<td>Agriculture, Food Production, Storage, and Distribution</td>
<td>Reading: Dobbins and Foss, (posted in LATTE) Pt. I, ch 1; Pt. IV, ch 31; Vitruvius, Bk. XI.</td>
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<td>Thurs., Feb. 16</td>
<td>Film on Roman Technologies</td>
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<td><strong>Mid Winter Recess:</strong></td>
<td>No University exercises Saturday, February 18 to Sunday, February 26</td>
<td><strong>week 5</strong></td>
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<td>Tues., Feb. 21</td>
<td>No class, Mid Winter Recess</td>
<td><strong>week 5</strong></td>
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<tr>
<td>Thurs., Feb. 23</td>
<td>No class, Mid Winter Recess</td>
<td><strong>week 5</strong></td>
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**week 6**

**Tues., Feb. 28**  
Finish Amphitheaters, Crowd Control, Spectacles, Theaters, and Sound Technologies  
**Reading:** same as Tues., Feb. 14

**Thurs., Mar. 2**  
The Lives and Training of Doctors: Celsus and Galen  

**week 7**

**Tues., Mar. 7**  
Diseases, Cures, and Surgical Procedures  

***Thurs., Mar. 9**  
Roman Medicine: Problems and Special Cases  
**Midterm Take-Home Essays due**  

**week 8**

**Tues., Mar. 14**  
Religious Architecture: the Pantheon  
**Reading:** Taylor, ch 3, “Walls, Piers, and Columns,” 92-132 (posted in LATTE); Taylor, ch 5, “Roofing and Vaulting,” 174-211 (posted in LATTE); Sear, ch 8, “Trajan and Hadrian,” 154-184 (posted in LATTE); and if you have time Taylor, ch 1, “Planning and Design,” 21-58; and Vitruvius, Bk. IV.

**Thurs., Mar. 16**  
Palatine Palaces: Home of the Emperor-Gods  
**Reading:** Sear, ch 7, “The Flavians,” 134-153; Sear, ch 8, “Trajan and Hadrian,” 154-184; and, by now, please buy Taylor, *Roman Builders*, so you can read Taylor, ch 6, “Decoration and Finishing,” 212-255; Review Vitruvius, Bk. VII.

**week 9**

**Tues., Mar. 21**  
Why Leave Rome in the Summer?  
Sperlonga and Capri: Imperial Summer Resorts and Necessary Technologies  
**Reading:** Sear, ch 5, “The Julio-Claudians,” 86-102 (posted in LATTE); Berry, 64-85 (posted in LATTE).

**Thurs., Mar. 23**  
Hadrian’s Villa at Tivoli: Water and Art  
**Reading:** Sear, ch 8, “Trajan and Hadrian,” 172-184.

**week 10**

***Tues., Mar. 28**  
Oplontis and Suburban Villas on the Bay of Naples  
**Prospectus for Final Paper with Bibliography**  
**Reading:** Guide to Oplontis (posted in LATTE) read all and look at pictures; Pliny the Elder, bk. XXXI on Fish
Aquatic Creatures, 279-283.

Thurs., Mar. 30  Survey of Other Roman Architectural Wonders Across the Roman Empire: North Africa, Roman East, Coatia
**Reading:** Sear, ch 9 “North Africa,” 185-209 (posted in LATTE); Sear, ch 10, “The European Provinces,” 210-230; Sear, ch 11, “The Eastern Provinces,” 231-254 (posted in LATTE)

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Tues., Apr. 4  Astronomy and Transportation: Overland and by Sea
**Reading:** Pliny the Elder, bk II, 10-41; bks. III-VI, 42-71; Review Vitruvius, Bk. IX.

Thurs., Apr. 6  Extraction Technologies, Minerals, and Mining
**Reading:** Oleson, ed. Craddock ch 4, “Mining and Metallurgy,” 93-114 with bibliography (posted in LATTE); Pliny the Elder bks. XXXIII-XXXIV, 286-322; Review Taylor ch 6, “Decoration and Finishing,” 212-255.

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**Passover Spring Recess:** No University exercises Tuesday, April 11 to Tuesday, April 18, Wed., April 19 = Brandeis Monday

Tues., Apr. 11  No Class, Passover Spring Recess

Thurs., Apr. 13  No Class, Passover Spring Recess

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**Tues., Apr. 18**  No Class, Passover Spring Recess

**Wed., Apr. 19**  Brandeis Monday

**Thurs., Apr. 20**  Final Paper/Projects Due
Student Presentations

---  week 14 ---

**Tues., Apr. 25**  Student Presentations

**Thurs., Apr. 27**  Student Presentations

---  week 15 ---

**Tues., May 2**  Student Presentations, Last Class
Course Wrap-up,
Roman Technology and the Human Condition

---  week 16 ---

**Wed., May 3 and Thurs., May 4, 2017, Study Days**

**Friday, May 5 - Friday May 12, 2017, Final Examination Period**