

The Impact of Materials on Society
EMA 1004 Section 06H7
Class Periods: MWF, Period 3 (9:35-10:25am)
Location: Pugh 170
Academic Term: Fall 2019

Instructor:

Prof. Kevin Jones;
Office: 160 Rhines;
Telephone: 846-3301;
e-mail: kjones@eng.ufl.edu,
text: 352 219 6641
Office Hours: Tuesday, Wednesday, Friday Period 4; or when I'm in my office

Prof. Jones will be joined by Dr. Sophia Krzys-Acord (Sociology), Prof. Susan Gillespie (Anthropology), Prof. Ken Sassaman (Anthropology), Prof. Mary Ann Eaverly (Classics), Prof. Florin Curta (History), Prof. Sean Adams (History), Prof. Haven Hawley (Libraries) and Prof. Marsha Bryant (English)

Teaching Assistants:

Please contact through the Canvas website

- tbd

Catalog Description –

This course explores the connections between the discovery of new materials -- such as ceramics, concrete, precious stones and metals, glass, steel, plastics and semiconductors -- and social transformations worldwide. To see these connections, the course will fuse basic concepts in materials science and engineering with perspectives and methods from anthropology, history, English, classics, and sociology. From ancient cities and Roman baths, to steel foundries and Tupperware parties, to virtual communities and nanomedicine, we will learn how the physical properties of different materials intersect with cultural variables like gender, race, power/authority, religious beliefs, values, and financial and political systems to shape human civilization. By connecting lessons from the past to the inventions of cutting-edge materials, we will also explore the future social impacts of new materials in medicine, construction, transportation, clean energy, sports, and other areas. Engineers play important roles in changing or maintaining the structure and fabric of society. This course will explore how their materials-based technologies shape our society, as well as how society shapes engineering innovations.

Prerequisites and Co-requisites - none

Course Objectives

This course will introduce students to how new materials impacted social structure both historically and in the present day, and to the social and cultural forces that shape the development and use of materials and technologies from the past to future. To do this, this course will:

- Examine the interrelated nature of society and materials engineering
- Demonstrate how materials can be manipulated to solve technical and sociocultural problems
- Explore how social and cultural systems shape how humans perceive the intrinsic physical properties of materials
- Discuss how the impact of materials on society varies with the cultural and historical context.
- Give students a variety of approaches from the humanities, social sciences, and sciences to examine and shape the impact of materials on society.
- Teach students basic skills in cross-disciplinary communication, team work, and argumentative writing.
- Teach critical thinking about how disciplinary approaches and personal beliefs shape our understanding of materials.
- Teach creative thinking about how to apply this knowledge through applied projects discussing future materials innovations.

Course Outline

This course serves as a test bed for the development of a new course at universities and colleges around the country. Each week of the course will focus on a particular class of materials. The first two days of each week will examine the discovery of a particular material, its physical properties, and historical case studies of its major social impacts. In preparation for the third class meeting each week, we will watch a short video lecture on modern materials developed by scientists from around the U.S. The third class meeting will feature an in-class group activity to discover the possible social impacts of these future materials. A schedule of topics will be provided in the course notes.

Professional Component (ABET):

Not an ABET evaluated course

Required Textbooks and Software

- The Substance of Civilization
- Stephen Sass
- Any edition
- 978-1-55970-371-0 or 978-1-55970-473-1
- Additional readings and course materials will be provided On-Line throughout the semester. The class has a very comprehensive Canvas website and additional open source reading

Weekly Schedule

**Impact of Materials on Society
Fall 2019 –Course Outline**

8/21-23 Introduction to class - Prof. Kevin Jones and course team;

- Introduction to Clay

- 8/21 – KJ and SA introduction – overview
 - pre-survey
 - Hand out impact paradigm and go through it. Edit it ongoing
 - Kevin to define properties of materials
- 8/23 –Lecture 2 KJ introduce concept map and synthesis

Clay 8/26-8/30 Entanglement of Earth: The Age of Clay versus the Age of Rare Earths - Team with Prof. Susan Gillespie (Anthropology)

- 8/26 – SG lecture Entanglement
- 8/28 – KJ intro to clay
- 8/30 –Homework/ rare earths activity

Ceramics 9/4-9/9 Glass/Ceramics and Modern Functional Materials - Team with Prof. Ken Sassaman (Anthropology)

- 9/2 (Monday)– labor day
- 9/4 (Wednesday)– KJ intro to glass/ ceramics
- 9/6 (Friday)– KS lecture Chaine Operatoire
- 9/9 (Monday)– KJ Homework/Ceramics activity

Copper 9/11-9/16 Copper and Bronze – Team with Prof. Florin Curta (History)

- 9/11 (Wednesday) – KJ intro to copper/bronze
- 9/13 (Friday) – FC Copper lecture/Trade
- 9/16 (Monday) –KJ Homework/Copper Activity

Concrete 9/18-9/23 Concrete: Engineering Society through Social Spaces - Team with Prof. Mary Ann Eaverly (Classics)

- 9/18 (Wednesday) – KJ Intro to concrete

- 9/20 (Friday)- MAE lecture Roman Concrete/Affordance
- 9/23 (Monday) – KJ Homework/Concrete activity

Gold 9/25-9/30 Gold, Silver, and the Creation of Value- Team with Prof. Florin Curta (History)

- 9/25 (Wednesday) – KJ intro to gold/silver
- 9/27 (Friday) – FC Gold lecture/Value
- 9/30 – (Monday) KJ Homework/ Gold activity

Concrete Bars and Midterm 10/2-10/9

- 10/2 (Wednesday) – Make concrete bars
- 10/4 (Friday) – Homecoming
- 10/7 (Monday) - Review impact paradigm, read “In the Making” and review for midterm
- 10/9 (Wednesday) - Midterm
- 10/11 (Friday) – Break concrete bars

Steel 10/14-10/18 Iron, Steel, and the Entrepreneur - Team with Prof. Sean Adams (History)

- 10/14 (Monday) – KJ intro to Steel
- 10/16 (Wednesday) – SA lecture Creative Destruction
- 10/18 (Wednesday) – KJ Homework/Steel activity

Aluminum 10/21-10/25 Aluminum, Transportation, and Company Development - Team with Prof. Seam Adams (History) (monopolies)

- 10/21 (Monday) – KJ intro to Aluminum
- 10/23 (Wednesday) – SA lecture Monopolies
- 10/25 (Friday)– KJ Homework/ Aluminum activity

Plastics 10/28 -11/1 Plastics, Polymers, Earl Tupper, and Materials Marketing - Team with Prof. Marsha Bryant (English)

- 10/28 (Monday) – KJ intro to Polymers
- 10/30 (Wednesday) - MB lecture/Marketing
- 11/1 (Friday) – KJ Homework/ Plastics Activity

Paper 11/4-11/8 Writing Materials: The Politics and Preservation of Knowledge - Team with Prof. Haven Hawley(Library)

- 11/4 (Monday) – KJ intro to writing materials
- 11/6 (Wednesday) - HH lecture/Information storage
- 11/8 (Friday) – KJ Homework/Writing activity

Silicon 11/13-11/18 Semiconductors and Cyborgs: Human-Material Relations in the Networked Society - Team with Dr. Sophia Acord (Sociology)

- 11/11 (Monday) –no class Veterans Day
- 11/13 (Wednesday) KJ intro to semiconductors
- 11/15 (Friday) - SA lecture Human-Material Relations
- 11/18 (Monday) – KJ and SA Homework/Activity for semiconductors
- 11/18 (Monday) Evening Review for Exam 2 and poster requirements
- 11/21 (Wednesday) Thanksgiving
- 11/23 (Friday) Thanksgiving

Exam 2 and Final Posters 12/2-12/4

- 12/2 (Monday) – Exam 2 in class
- 12/3 (Tuesday evening) – Poster session 1 in the classroom from 6:15-8:00PM
- 12/4 (Wednesday evening) – Poster session 2 in the classroom from 6:15-8:00PM

Attendance and Expectations - All students are expected to attend and participate in class. The class is taught in an interactive lecture format, and includes discussion and practice activities. Cell phones should be turned off in class. Reading of newspapers, work on assignments for this or other classes, or other activities that are not part of the class are not allowed during class time.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Weekly Homework	10	30%
Weekly Group Exercise	10	10%
First Exam	100	20%
Second Exam	100	20%
Final Project	100	20%
Total		100%

Grading Policy

Percent	Grade	Grade Points
91.5 - 100	A	4.00
88.5 - 91.4	A-	3.67
85.5-88.4	B+	3.33
81.5-85.4	B	3.00
78.5-81.4	B-	2.67
75.5-78.4	C+	2.33
71.5-75.4	C	2.00
68.5-71.4	C-	1.67
65.5-68.4	D+	1.33
61.5-65.4	D	1.00
58.5-61.4	D-	0.67
0 - 58.4	E	0.00

More information on UF grading policy may be found at:
<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that

are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the [Office of Title IX Compliance](#), located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.