

Application for General Education and/or Gordon Rule Writing Certification

- I. A.) Course Number and Title: EGN 1935 Materials Impact on Society
- B.) Credit Hours: 3.0
- C.) Prerequisites: None
- D.) Current Classification (current 1-year approval)
1. General Education Code: B C D H M N P S None
 2. Gordon Rule (Writing): E2 E4 E6 None
 3. Gordon Rule (Math): M None

Requests:

- II. General Education
- A.) Requested Classification: B C D H M N P S
- B.) Effective Date: Fall 2011 Spring Summer _____ (year)
- Or
- 1-time Approval _____ (year)
- C.) General Education purpose and learning outcomes for the course? [Detailed attached response requested.]

III. Gordon Rule

- A.) Requested Classification for course E2 E4 E6
- B.) Writing Requirements:
- 1.) Number of papers, essays, etc. with word count specified.
Two 1000-word essays.
 - 2.) Due Dates? Returned with feedback dates? **Yes. See Syllabus.**
 - 3.) What type of feedback will be provided the student (in reference to writing skill)?
 x Grade x Corrections x Drafts Other
 - 4.) Assessment
 - a.) Will the written work be evaluated for grammar, punctuation and proper usage of standard written English? **Yes.**

- b.) Will written work be evaluated for an effectiveness, organization, clarity and coherence of writing? **Yes.**
- c.) Will a published rubric be used? **Yes.**

IV. Syllabus

Courses that offer students General Education and/or Gordon Rule credit must provide clear and explicit information for the students about the classification and requirements.


A.) For courses with a General Education classification, the syllabus should include:

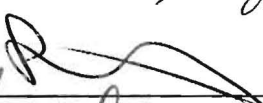
- Statement of the General Education Purpose of the Course with attention to the General Education Classification requested **Page 1**
- List of assigned General Education Student Learning Outcomes **Pages 1-2**
- List of any other relevant Student Learning Outcomes **Page 2**
- List of required and optional texts **Page 3**
- Weekly course schedule with sufficient detail (e.g. topics, assigned readings, other assignments, due dates) **Pages 3-5**

B.) For courses with Gordon Rule (writing) classification, the syllabus should include:

- A description/list of Gordon Rule expectations for students (word count, page lengths and deadlines for assignments). **Page 6**
- A statement to the effect that students written assignments will be evaluated with respect to grammar, punctuation, and usage of standard written English, as well as clarity, coherence, and organization. Reference rubric. **Page 6**
- A statement indicating that students will receive feedback on written assignments prior to the last class meeting. **Page 6**
- Assessment note to include basis for grading (rubric) and a statement identifying the two components of the grading, letter grade for course and approved completion of the writing portion of the course. **Page 6**

V. Submission and Approvals

A.) Submitted by (Signature of Instructor): 
 Date 9/13/2010

B.) Department Approval: 

C.) College Approval: 

D.) Committee Action: Approved Denied Tabled Date _____

Course Syllabus
EMA 1935 Materials Impact on Society
Section 2825, Semester Fall 2010

1. Catalog Description - The discovery and development of specific classes of materials are considered from the perspective of having dramatically altered the course of human history and societies. Materials will be presented in terms of both historical and technical context and considered in terms of their political, financial, health, and technology impact; 3 credit hours.
2. Prerequisites and Co-requisites - none
3. General Education Purpose of the Course-
 - a. To provide instruction regarding the role of materials in the past, present, and future in terms of their impact on the political, financial, health, and technological aspects of society.
 - b. To establish relationships between the availability, development, control, or implementation of materials and the resulting impact on societies.
 - c. To consider these relationships from both a historical and technological (science and engineering) perspective.
 - d. To provide a basis to evaluate present and future biases to the use and potential societal impact of technology.

This course contributes to the University of Florida's General Education curriculum, specifically in the area of (S) Social Science. With respect to social science, the course will provide instruction in the key themes, principles and terminology of the societal and social aspects of historical and futuristic materials. The course will focus on the history, underlying principles and the societal uses of a range of materials. In addition, students will learn to identify, describe and explain social institutions, structures and processes involved in the materials ages discussed. The course will emphasize the evaluation of societal needs, materials properties, and the factors shaping society's opinions and related uses of materials.

4. General Education Student Learning Outcomes –

The course is intended to provide students with an understanding of the historical role of materials in influencing the course of societal changes. Associated with this understanding, students will be able to identify the relationship between materials properties and key technologies and to evaluate the potential impact of future materials developments in terms of financial, political and health considerations. As a result, participants in this course are expected to achieve the following learning outcomes:

- a. Know key themes, principles, and terminology of historical and modern materials science. Know the history, theory and/or methodologies associated with the development

of materials throughout history. Identify, describe and explain social institutions, structures and processes shaping the use of materials across societies.

b. Apply formal and informal qualitative and/or quantitative analysis effectively to examine the processes and means by which individuals make personal and group decisions. Assess and analyze ethical perspectives in individual and societal decisions regarding the use of material classes.

c. Communicate (individually and in groups) knowledge, thoughts and reasoning clearly and effectively in forms appropriate to engineering, and in forms required to relating engineering to other sectors of society.

5. Contribution of course to meeting the professional component (Engineering)- This course provides 3 credits towards the understanding of the impact of different materials classes.
6. Relation to Engineering Program Outcomes - This course addresses the following MSE Program outcomes (note: Numbers refer to the list of MSE Program outcomes):
 - (1) Ability to apply knowledge of mathematics, science, and engineering to materials systems. (Low)
 - (4) Ability to apply and integrate knowledge of structure, properties, processing, and performance to solve materials selection and design problems within realistic constraints. (Low)
 - (9) Understanding of the economic impact of engineering solutions. (High)
 - (10) Understanding of the global, societal, and environmental impact of engineering solutions. (High)
 - (12) Knowledge of contemporary issues. (Medium)
7. Instructor – Dr. Scott Perry
 - a) Office location: 206 Rhines
 - b) Telephone: 846-3333
 - c) e-mail address: ssp@ufl.edu
 - d) Website: <http://legacy.mse.ufl.edu/nanotribology/>
 - e) Office hours: TBA
8. Teaching Assistant – N/A
9. Meeting Times – MWF, Period 2
10. Laboratory schedule – N/A
11. Meeting Location – T R, L001 TUR
12. Material and Supply Fees – N/A

13. Textbooks Required –

The Substance of Civilization

Stephen L. Sass, ISBN-13: 9781559704731

Understanding Materials Science

Rolf Hummel ISBN-13: 9780387983035

(Do not purchase hardcopy! UF e-copy available-

<http://dx.doi.org/10.1007/b137957>)

14. Recommended Reading – Supplementary reading and links to website will be provided throughout the semester.

15. Course Outline – The following topics will be addressed throughout the semester considering the relationship between materials characteristics, availability, and technical understanding and the resulting impact on the financial, political, and health concerns of society. Although organized by the historical appearance of a given material category, course coverage will be equally divided according to the complete coverage of an impact paradigm.

Impact Paradigm

Material

What is the material of importance?

What are the general properties of this material?

What is the source of the material?

What is the general abundance of the material?

What are the unique (enabling) properties of the material?

What discovery/development led to the material impacting society?

Historical

What is the first known use of the material?

What people groups were involved at the time of first use?

At what time did the material become enabling?

What events limited the impact of the material prior to or following its development/discovery?

Technological

What technology did the material enable?

What role did the material play in the technology?

What property of the material enables the technology?

What are the limits of the technology?

How do these limits relate to the properties of the material?

Societal

In which realms of society did the materials development have an impact?

What were the financial implications of the development?

What were the health implications of the development?

What were the governmental implications of the development (war)?
What were the social implications of the development?
What are the future societal needs with respect to the material/technology?
To what extent will materials processing play a role in future impact?

Week 1. Materials properties

What is a material?
What are the relevant properties?
Materials measurements
How will impact be defined?

Week 2. The Ages of Stone and Clay

Week 3. The Age of Metals

Gold, Silver, and the Rise of Empires
The Age of Iron

Week 4. Materials of Warfare

Projectiles and accelerants
Armor
Explosives

Week 5. Building for the Ages

The Birth of Modern Metals
Steel: Master of Them All

Week 6. Materials Enabling the Written Word

Clay tablets
Printing technology
Paper production

Week 7. Glasses

Structural definition
Natural occurrence
Early uses
Processing
Optics (astronomy, microscopy, vision correction)
Non-optic glass technologies (pyrex)

Week 8. The Timeless Age of Carbon

Man-made Organic Materials- Plastics
Diamond: The Superlative Substance
Carbon Nanotubes and Buckyballs

Week 9. Nuclear Materials

Uranium

Basic principles of fission and fusion (simple kinetics)
Nuclear arms
Nuclear power
Nuclear waste

Week 10. Composites

Bone as an example
Concrete
Asphalt
Carbon fiber (The Lesson of Nature: When men flew...)

Week 11. The Age of Silicon

Single crystal silicon
Lithography
Electronic properties (semiconductors)

Week 12. Magnetic Materials

Storage media
Electric motors
Superconducting magnets (MRI technology)

Week 13. Nanomaterials

Definition of nanomaterial
Engineering/medical advances
Societal concerns
 Identification
 Toxicity

Week 14. Biomaterials

Biomimetic materials- uses outside of medicine
Biocompatible materials (polymers, metals, ceramics)
Survey of medical applications

Week 15. Materials in the 21st Century

Developing 3rd World Countries (water purification)
Materials Commodities (precious metals, oil, ...)
Energy-related Materials (solar, wind, batteries...)

16. Attendance and Expectations - Attendance is not part of the course grade; however, all students are expected to attend class. The class is taught in an interactive lecture format, and includes discussion and practice problems. 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.

17. Assignments – 3 exams (20% each), 2 technical reports, 1000 words each (15% each), 1 group project (10%).

<u>Assignment</u>	<u>Due Date</u>	<u>Credit</u>
Exam 1	Friday, Sept. 24	20%
Historical Essay	Friday, Oct. 22	15%
Exam 2	Monday, Nov. 1	20%
Modern Mat. Essay	Monday, Nov. 22	15%
Group Project	Wednesday, Dec. 1	10%
Exam 3	Wednesday, Dec. 8	20%

Gordon Rule Expectations:

This course meets the expectations set by the State of Florida for writing credits that contribute to the fulfilling of the Gordon Rule requirement. The completion of two 1000-word technical reports will be required. One will evaluate a historical development in the use of a materials class (due Week 9) while the second will evaluate a modern implementation of a materials class (due Week 14). These assignments will be evaluated with respect to content, grammar punctuation, and usage of standard written English, as well as clarity, coherence, and organizational approach demonstrated in lecture.

Individual appointments with the instructor will serve to guide the development of drafts prior to submission. Students will receive feedback on these assignments (Weeks 8 and 14, respectively) in the form of grades and technical evaluation of content. Examples of an evaluation rubric for these essays will be provided on-line.

18. Grading Scale - (A \geq 92%) (A \geq 88%) (B+ \geq 84%) (B \geq 80%) (B- \geq 76%) (C+ \geq 72%) (C \geq 68%) (C- \geq 65%) (D+ \geq 62%) (D \geq 59%) (D- \geq 56) (E $<$ 56%).

NOTE: In order to earn the appropriate General Education credits, students must earn a grade of C or better in the course AND must earn an S (satisfactory) evaluation on the writing requirements of the course.

19. Make-up Exam Policy - Make-up exams are given only for reasons of illness and in accordance with University of Florida regulations.
20. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.
21. Accommodation for Students with Disabilities – Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

22. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
 - SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
 - Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
 - Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.
23. Software Use – All faculty, staff and student 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.