

**Course Syllabus**  
**EMA 4714 Materials Selection and Failure Analysis**  
**Section 2983, Spring 2015**

1. Catalog Description – Philosophy and practice of engineering selection of materials. Case studies in product liability and failure analysis.
2. Pre-requisites and Co-requisites - EMA 4324 Stability of Materials, EGM 2511 Engineering Statics, EGM 3520 Mechanics of Materials, Engineering Statistics [co-requisite].
3. Course Objectives - This is a senior level capstone design course in Materials Science and Engineering. The specific objectives for the course are:
  1. Describe, both conceptually and analytically, how system components work and to model function or performance using scientific engineering principles learned as part of your undergraduate education
  2. Participate in an integrated design activity using fundamentals of “systems engineering”, where performance and behavior have to be analyzed in light of consumer expectations and merchantability of the design
  3. To gain experience in the selection of materials and optimization of behavior by using a systematic methodology which combines materials properties with the engineering function of the process or product design.
  4. To defend materials selection effectively both orally and in written form.
  5. To select and use appropriate industrial literature and library resources in the solution of material selection and failure analysis problems.
4. Contribution of course to meeting the professional component - This is a 3-credit course. It provides 3 credits towards design.
5. Relationship of course to program outcomes - This course addresses the following MSE Program outcomes (note: Numbers refer to the list of MSE Program outcomes):
  - (c) Ability to apply and integrate knowledge of structure, properties, processing, and performance to solve materials selection and design problems within realistic constraints
  - (d) Ability to function on multi-disciplinary teams
  - (g1,2) Ability to communicate effectively in both oral and written form
  - (h1) Understanding of the economic impact of engineering solutions
  - (h2) Understanding of the global, societal, and environmental impact of engineering solutions.

6. Instructor – Michele V. Manuel
  - a. Office location: 152 Rhines Hall
  - b. Telephone: 846-3780 (office)
  - c. E-mail address: mmanuel@mse.ufl.edu
  - d. Web site: <https://lss.at.ufl.edu/>
  - e. Office hours: 3-5 pm on Tuesday
  
7. Teaching Assistant – Philipp Alieninov
  - a. Office location: B09 Rhines Hall
  - b. Telephone: 846-3780
  - c. E-mail address: palieninov@ufl.edu
  - d. Office hours: TBA
  
8. Meeting Times – Tuesday: 7th Period  
Thursday: 7<sup>th</sup>-8<sup>th</sup> Period
  
9. Meeting Location – Tuesday: FLG 210  
Thursday: FLG 230
  
10. Material and Supply Fees - None.
  
11. Textbooks and Software Required – “Engineering Design”, 5<sup>th</sup> edition by George E. Dieter and Linda C. Schmidt, McGraw Hill, 2012. Supplementary reading and links to various other resources/websites are provided and updated throughout the semester.
  
12. Recommended Reading – “Materials Selection in Mechanical Design”, 3<sup>rd</sup> edition by Michael F. Ashby, Elsevier, 2005 [ISBN 0-7506-6168-2]
  
13. Course Outline – Course outline will be provided at the beginning of the semester.
  
14. Attendance and Expectations – Attendance/participation is part of the course grade. 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.
  
15. Grading – Homework: Extra Credit, 2 unit examinations: 30% each; Design Project: 30%; Class/Group Participation: 10%.
  
16. Homework - Homework will be due at 11 pm on the day indicated for each homework on the website. The homework will not be passed out in class.

You may turn in the homework anytime prior to the deadline. Homework and solutions will be posted on the course website. Note that the homework will be posted in pdf format, which requires the use of the Acrobat Reader. If you do not have it installed on your computer, it can be downloaded for free from <http://www.adobe.com/supportservice/custsupport/download.html>

All exams must be completed in ink; pencil is not allowed. Lack of attendance at any exam will result in automatic failure in the course.

17. Grading Scale –

Percentage	≥ 92	≥ 88	≥ 84	≥ 80	≥ 76	≥ 72	≥ 68	≥ 65	≥ 62	≥ 59	≥ 56	< 56
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E

18. Make-up Exam Policy – Make-up exams are given only for reasons of illness and in accordance with University of Florida regulations.

19. 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.

20. 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.

21. 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.

22. 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.

# UNIVERSITY OF FLORIDA

## Student Honor Code (Abridged)

*Preamble:* In adopting this Honor Code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the University community. Students who enroll at the University commit to holding themselves and their peers to the high standard of honor required by the Honor Code. Any individual who becomes aware of a violation of the Honor Code is bound by honor to take corrective action. Student and faculty support are crucial to the success of the Honor Code. The quality of a University of Florida education is dependent upon the community acceptance and enforcement of the Honor Code.

*The Honor Pledge:* We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty 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."

Violations of the Student Honor Code include (in part):

(a) **Plagiarism**, in the form of quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution; or submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

(b) **Unauthorized Use of Materials or Resources ("Cheating")**. A student shall not use unauthorized materials or resources in an academic activity. Unauthorized materials or resources shall include:

1. Any paper or project authored by the student and presented by the student for the satisfaction of any academic requirement if the student previously submitted substantially the same paper or project to satisfy an academic requirement.
2. Any materials or resources prepared by another student and used without the other student's express consent or without proper attribution to the other student.
3. Any materials or resources that the faculty member has prohibited.
4. Use of a cheat sheet when not authorized to do so or use of any other resources or materials during an examination, quiz, or other academic activity without the express permission.

(c) **Prohibited Collaboration or Consultation**. A student shall not collaborate or consult with another person on any academic activity unless the student has the express authorization.

1. Prohibited collaboration or consultation shall include but is not limited to:

- Collaborating when not authorized to do so on an examination, take-home test, writing project, assignment, or course work.
- Collaborating or consulting in any other academic or co-curricular activity after receiving notice that such conduct is prohibited.
- Looking at another student's examination or quiz during the time an examination or quiz is given. Communication by any means during that time, including but not limited to communication through text messaging, telephone, e-mail, other writing or verbally, is prohibited unless expressly authorized.

2. It is the responsibility of the student to seek clarification on whether or not use of materials or collaboration or consultation with another person is authorized prior to engaging in any act of such use, collaboration or consultation.