

## ESI 5236 Reliability Engineering, M 6:00-8:45, Engr I - 384,

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**Instructor:** Dr. Petros Xanthopoulos (petrosx@ucf.edu), phone: (407) 823 5218.

**Credit hours:** 3 (3,0)

**Lecture:** M 6:00 - 8:45 PM, Room: Engr I - 384

**Office Hours:** Monday 10:00am-12:00pm, Engr II - 410

If you need to request an appointment (over the phone or in person) please send me an e-mail.

**Textbook:** C. E. Ebeling *An Introduction to Reliability and Maintainability Engineering* 2nd Edition, Waveland Press, Inc. ISBN-10: 1577666259.

Publisher's webpage: <http://www.waveland.com/Titles/Ebeling.htm>

**Prerequisites:** ESI 4234 (Quality Engineering) or equivalent. Also knowledge of basic statistics is necessary.

**Course Goals:** Course main goal is to introduce students to the statistical methods that are used in reliability and maintainability engineering. As a graduate course we will focus more in the mathematical and computational aspects and less in software related topics.

**Topics to be Covered:** failure distribution, constant failure rate model, time dependent failure models, reliability of systems, state dependent systems, maintainability.

### Important Dates:

- 5th September : Labor Day (no class)
- 14th November: There will be no live session (a pre recorded video will be posted)
- 10th October (In class): Midterm Exam
- 5th December (7:00-9:50pm): Final Exam

**Course plan:**

<b>Date</b>	<b>Related Material/ Activity</b>	<b>Related Textbook Chapter</b>
8/22	Course Overview, Probability Remainder	Chapter 1
2/29	Failure Distribution	Chapter 2
9/5	Labor Day (No Class)	
9/12	Constant Failure Rate Model	Chapter 3
9/19	Time Dependent Failure Models	Chapter 4
9/26	Reliability of Systems	Chapter 5
10/3	State - Dependent System, Midterm Review Session	Chapter 6
10/10	<b>Midterm Exam</b>	Chapters 1-5
10/17	State-Dependent Systems	Chapter 6
10/24	Design for Reliability	Chapter 8
10/31	Maintainabilty	Chapter 9
11/7	Design for Maintainability	Chapter 10
11/14	Analysis of Failure Data (Pre recorded)	Chapter 12
11/21	Reliability Testing	Chapter 13
11/28	Failure and Repair Distributions, Final Exam Review	Chapter 15
12/5	<b>Final Exam</b>	Chapters 6,8-10,12,13,15

**Assignments and Exams Policy:**

- Grading will be based on homeworks, exams.
- There will be two exams (35% each), and 4 homework assignments (30%).
- Both exams will be in class and closed books. However you can have a cheat sheet (one letter page written in both sides) and a calculator. Palmtops, cell phones, smart phones, tablets, personal computers and any device with internet connection cannot be used to substitute a calculator.

- There will be no make-up exams or quizzes unless you have a serious reason (e.g., illness with a doctor's report, jury duty or unexpected accident or a prescheduled participation in a international/national conference/meeting related to your major) and in such cases, you must notify as early as possible.
- Late homework submissions will not be accepted and you will get a credit of 0. Homework policy is non-negotiable.
- Each student is expected to submit his/her individual work. Should some submitted homework assignments be identical or suspected to be identical, all involved parties will get a grade of 0 on the particular homework assignment. For more info refer to **Plagiarism & Cheating** section.
- Requests for regrading of assignments and exams will be considered only within a one-week period from the time graded work is returned in class. Regrading can result in higher same or lower grade. Grades will be posted on Webcourses@UCF.
- Your homeworks, exams will be returned to you as soon as they are graded. Please keep your graded work for your records. You have to ensure that the grades are posted correctly and if you claim an error in the gradebook, you have to provide the graded work.
- You are responsible for checking the announcements, printing the assignments and reading material from the class web page located at Webcourses@UCF.

**Final Grade:** The final grade will be assigned as follows:

Letter Grade	Percentage	Grade Point Value
A	90-100%	4.00
A-	87-89%	3.75
B+	84-86%	3.25
B	80-83%	3.00
B-	77-79%	2.75
C+	70-73%	2.25
C	69% and below	2.00

Non integer percentages will be rounded to the closest integer (e.g. 87.5 % will become 88% and 81.3% will become 81%).

**Classroom Policy:**

- There is no attendance taken.

- Students are responsible for announcements and material covered in class.
- Cell phones, loud music and noisy behaviors are not allowed.

**Internet Usage:** You will be expected to have daily access to the internet and email, since I will be emailing you constantly about assignment updates, additions and changes. All students at UCF are required to obtain a Knight's Email account and check it regularly for official university communications. If you do not own a computer, there are computer accessible to you in all UCF's computer labs, and most computer labs have computers connected to the internet. For further information on computer labs, please see the following website:

[http://registrar.sdes.ucf.edu/webguide/index\\_quickfind.aspx](http://registrar.sdes.ucf.edu/webguide/index_quickfind.aspx).

**Dissability Policy:** The University of Central Florida is committed to providing reasonable accommodations for all persons with disabilities. Students with disabilities who need accommodations in this course must contact the professor at the beginning of the semester to discuss needed accommodations. No accommodations will be provided until the student has met with the professor to request accommodations. Students who need accommodations must be registered with Student Disability Services, Ferrell Commons Room 132, phone (407) 823-2371, TTY/TDD only phone (407) 823-2116, before requesting accommodations from the professor.

**Use of Webcourses@UCF:** For this class we will be using Webcourses@UCF for certain parts of the class. Webcourses is an online course management system (accessed through my.ucf.edu and then the "Online Course Tools" tab) which will be used as a medium for downloading course material and turning in assignments. My recommendation is to check Webcourses every 2-3 days for updates.

**Plagiarism & Cheating:** UCF faculty support the UCF Creed. Integrity - practicing and defending academic and personal honesty - is the first tenet of the UCF Creed. This is in part a reflection of the second tenet, Scholarship: - I will cherish and honor learning as a fundamental purpose of membership in the UCF community. - Course assignments and tests are designed to have educational value; the process of preparing for and completing these exercises will help improve your skills and knowledge. Material presented to satisfy course requirements is therefore expected to be the result of your own original scholarly efforts. Plagiarism and cheating - presenting another's ideas, arguments, words or images as your own, using unauthorized material, or giving or accepting unauthorized help on assignments or tests - contradict the educational value of these exercises. Students who attempt to obtain unearned academic credentials that do not reflect their skills and knowledge can also undermine the value of the UCF degrees earned by their more honest peers.

**Disclaimer:** This syllabus may be modified at the discretion of the instructor. Changes will be discussed in class and/or via email.