CPS 547 Software Measurement Spring 2018

Instructor: **Paulo de Oliveira**

E-mail: paulohgo@csu.fullerton.edu

Office Hours: Office Hours are conducted through emails, on-line discussion board provided by Titanium. Face to face meeting may be arranged by appointment.

Lectures: New Lecture Materials will be posted at least every two weeks.

Textbook: William A. Florac, Anita D. Carletton, Measuring the Software Process, Statistical Process Control for Software Process Improvement. Addison Wesley. ISBN 0-20160444-2

References:

1. Mario F. Triola, Elementary Statistics. Addison Wesley. ISBN 0-201-61477-4 (or any other Statistics book)
2. CMMI Guidelines for Process Integration and Product Improvement, Addison Wesley
3. www.cmmiinstitute.com
4. More references will be added on the class website.
5. John C. Munson, Software Engineering Measurement. Auerbach. ISBN 0-8493-1503-4.
6. Norman E. Fenton, Shari Pfleeger, Software Metrics. PSW. ISBN 0-534-95425-1 7. Websites of Agile Alliance and Scrum Alliance Note: Reference 5 to7 are NOT required.

Coursework: There will be reading assignments, Titanium discussions, class project/assignments, and mid and final exams.

Grading

The final grade will be based on a total of 100 points:

Discussion Board: 20 points (2.5 pts for each meaningful post on BB, you are expected to make 8 posts total)

Mid-term exam: 15 points

Group Project: 20 points

Two group assignments: 20 points (10 points each)

Final Exam: 25 points

Grading Scale:

90% to 100%: guaranteed A (ranging from A+ to A-)

80% to 89%: guaranteed at least a B (ranging from B+ to B-)

70% to 79%: guaranteed at least a C (ranging from C+ to C-)

60% to 69%: guaranteed at least a D

< 60%: F

The boundaries may move a little downwards if the class average is lower than expected.

In line with the departmental policy, the grading criteria will include writing style.

Details on assignments

Discussion Board: Discussion topics will be posted on Titanium by the Instructor. Please be thoughtful and respectable when posting your comments. You will be given enough time to post answers to each topic. NO LATE POSTS WILL BE ACCEPTED.

Group Project: Possible topics of class projects will be given. You must choose from the topics provided. A Word document and a PPT will be expected. No audio or video recordings will be required for this course.

Assignments: Two group homework assignments will be given during the semester. Typically, late submission will NOT be accepted.

Exam: The mid-term exam will be done week 7. The final exam will be given on May 18. Details will be provided during the semester.

Course Description: This course has several different goals. It will provide you with practical approaches in measuring software engineering activities. You will learn how to measure software products, software projects, software processes, as well as how to analyze process behavior using statistical techniques. Topics in Agile (Scrum, XP, and etc.) will be discussed. Throughout the semester, the best practices in the industry will be discussed.

Topics and Tentative Schedule (subject to change):

1. The basics of measurement (2 weeks) Chapter 1 (textbook)
    a. Overview of the course
    b. Managing and measuring process behavior
    c. The scope of software metrics Framework for process behavior measurement

Possible class project topics will be announced by February 14.

2. Measurement and Analysis Process Area from CMMI (1 week)
3. Planning for Measurement (2 weeks) Chapter 2 (textbook)
    a. Identifying measurement objectives
    b. Selecting and defining measures
    c. Operational Definition
    d. Measures and process
4. Collecting Data (2 weeks) Chapter 3 (textbook)
    a. The specifics of data collection Assessing collected data
    b. Retaining data
    c. Tools

Homework 1 will be given at the end of Chapter 3

5. Basic Statistics your need to know (1 week) (any Statistics book)
6. OPP and QPM Process Areas from CMMI (1 week)
7. Analyze Process Behavior (2 weeks) Chapter 4 (textbook)
    a. Understanding process variation
    b. Separating signals from noise
    c. Control Chart: the basics

Homework 2 and the mid-term exam will be given at the end of chapter 4.

8. More on Process Behavior Charts (2 weeks) Chapter 5 and 6 (textbook)
    a. More on control charter
    b. How to establish the process performance baselines
    c. Other statistical techniques (other than control charter) you may use
    d. Issues in analyzing process behavior
9. From Stable Process to Capable Process (1 week) Chapter 7
    a. OPM and CAR process area (CMMI Level 5 PAs)
    b. Three paths to process improvement (Chapter 7)
10. Summary (1 week) Chapter 8

Final exam will be a take-home exam given the weekend before the end of the semester.

Important Dates (tentative):

Approximate dates for the main assignments:

- The abstract of your project: March 9
- Group HW1: Posted on week 5, due on week 7
- Mid-term: Week 7
- Group HW2: Posted on week 7, due on week 11
- Final exam: Week of May 14 (exact date TBD)

- Final project: Topic approved by Feb 16, due on May 16. Early delivery is encouraged.

Dates are subject to change!

Academic Dishonesty Policy (You must read this part)

Academic dishonesty includes but is not limited to cheating on examinations or assignments, unauthorized collaboration, plagiarism, falsification/fabrication of university documents, any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor), assisting or allowing any of these acts, or the attempt to commit such acts.

Cheating is defined as the act of obtaining or attempting to obtain credit for work by the use of any dishonest, deceptive, fraudulent, or unauthorized means. Examples of cheating include, but are not limited to, the following: using notes or aides or the help of other students on tests and examinations in ways other than those expressly permitted by the instructor, plagiarism as defined below, tampering with the grading procedures, and collaborating with others on any assignment where such collaboration is expressly forbidden by an instructor. Violation of this prohibition of collaboration shall be deemed an offense for the person or persons collaborating on the work, in addition to the person submitting the work. Documentary falsification includes forgery, altering of campus documents or records, tampering with grading procedures (including submitting altered work for re-grading), fabricating lab assignments, or altering or falsifying medical excuses or letters of recommendation.

Plagiarism is defined as the act of taking the work (words, ideas, concepts, data, graphs, artistic creation) of another whether that work is paraphrased or copied in verbatim or near verbatim form and offering it as one's own without giving credit to that source. When sources are used in a paper, acknowledgment of the original author or source must be made through appropriate citation/attribution and, if directly quoted, quotation marks or indentations must be used. Improper acknowledgment of sources in essays, papers, or presentations in prohibited. (PLEASE READ THE ABOVE; VERY IMPORTANT; ANY VIOLATION may result in an F grade)

The initial responsibility for detecting and dealing with academic dishonesty lies with the instructor concerned. An instructor, who believes that an act of academic dishonesty has occurred, is obligated to discuss the matter with the student (s) involved. The instructor should possess reasonable evidence with respect thereto, such as documents or personal observation. In this meeting, and throughout the process, every effort should be made to preserve the integrity of the educational relationship between instructor and student. The student should be given the opportunity to respond to the complaint. If the violation is discovered during the offering or grading of the final exam, the instructor may assign a mark of "RP" until the instructor has an opportunity for such a meeting. Also because the student may challenge the allegation, he or she must be allowed to attend all classes and complete all assignments until the appellate process is complete. When necessary, such discussion may be conducted by telephone or electronic mail.

However, if circumstances prevent consultation with student(s), the instructor may take whatever action (subject to student appeal) he/she deems appropriate. An instructor who is convinced by the evidence that a student is guilty of academic dishonesty, shall:

1. Assign an appropriate academic penalty, including, but not limited to: oral reprimand; “F” or “O” on the assignment; grade reduction on assignment or course; or “F” in the course. Factors to take into consideration in assigning a grade sanction include: normative sanctions for comparable acts, severity of the offense (academic gain or potential academic gain if the action had gone undetected), harm or potential harm to other students in the class, premeditation of the act.

2. Report to the student(s) involved, to the department chair, and to the Dean of Students Office, Judicial Affairs, the alleged incident of academic dishonesty, including relevant documentation, actions taken by the instructor including grade sanction, and recommendations for additional action that he/she deems appropriate. The written report should be distributed as soon as possible, preferably within 15 calendar days from discovery, but not later than 30 calendar days after the first day of classes of the regular semester (fall or spring) following the grade assignment.

The Dean of Students Office, Judicial Affairs, shall maintain a disciplinary file for each case of academic dishonesty with the appropriate documentation. Students shall be informed that a disciplinary file has been established and that they have an opportunity to appeal the actions of the instructor under the Academic Appeals Policy. Dean of Students Office, Judicial Affairs may initiate disciplinary proceedings under Title 5, Section 41301 and Executive Order 970. Sanctions which may be assessed include but are not limited to: warning, probation, educational sanctions, removal from academic program, suspension, expulsion, denial of admission or enrollment in university classes including Extended Education.

When two or more incidents involving the same student occur, the Dean of Students Office, Judicial Affairs shall initiate disciplinary proceedings. A student may appeal any sanction assessed for a charge of academic dishonesty under UPS 300.030, “Academic Appeals.” If the Academic Appeals Board accepts the student’s appeal, then the disciplinary file will be purged. If a student does not appeal the instructor’s action or if the Academic Appeal Boards rejects the student’s appeal the disciplinary file will be maintained in a confidential file in the Dean of Students Office, Judicial Affairs for a minimum of seven years. Disciplinary probation and suspension are noted on the student’s academic record during the term of the probation or suspension. A permanent notation will be made on a student’s academic record if he or she is expelled from the university. A second academic integrity violation usually results in suspension from the university for a period of time.

In order to facilitate due process and to insure that a student knows that academic dishonesty is subject to action, this policy shall be published in the Catalog and Student Handbook. Copies of this policy shall also be available in every department office, the Dean of Students Office, and in the Office of the Vice President for Student Affairs.