Course Syllabus

COSC 4319W.01 Software Engineering

Spring 2018, 3 Credit Hours

Location / Time AB1-206, 9-9:50 MWF

Instructor: **David Burris, Ph.D., CCP, CSP**

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Course information is available via Blackboard

Office Hours: Monday/Wednesday/Friday: 10-11
Tuesday/Thursday 10:00-11:00
others by appointment including 7:00 – 7:45 A.M.

I spend a lot of the time on campus. I may not always be able to stop what I am doing, but you are free to drop by any time you need help. Travel is required for my duties as university Articulation Coordinator. In addition, department and university meetings occasionally consume a lot of my time including office hours. Do not put off till tomorrow what you can accomplished today. If you need help with concepts or assignments see me as soon as the need develops. I frequently answer questions online, especially where you have a choice or that require a decision. If you need something requiring a detailed response, see me at the office.

Departmental Course Objective: This course is an introduction to formal methods of specifying, designing, implementing, and testing software for large programming projects. Methods of estimating and predicting reliability are discussed. **Without exception, each student must actively participate in a large group project**. Prerequisites: 6 hours of advance CS. Credit 3 hours.

Instructor Specific Objectives: Advanced specification / design principles, Millers Law, Graicunas' Law, specification metrics, design metrics, implementation metrics, statistical metrics, optimization for time, optimization for space, Software Engineering Institute (SEI) including the Capability Maturity Model (CMM), International Standards for measuring quality during development / implementation / installation (e.g., ISO 2000), estimating time / resources to project completion, Tiger Teams, RAPID/RAD Software Development, Agile

Development, and organization of development teams from a management perspective are amongst the topics covered in class. Top-Down-Iterative Refinement, Jackson's Technique, Object Oriented Specification / Design / Implementation, and additional formal software specification / design / implementation strategies are covered. A variety of software life cycle models are discussed. Testing including the use of "black box" testing, "white box" testing, and use of specialized test teams is considered. Special emphasis is placed on methods such "structured walk through" or "formal technical reviews," research on the effects of environmental factors, and statistical methods that may be used to improve software quality. These topics may not be effectively covered without considering them from both a technical and managerial perspective. Industrial software certification programs for individuals as well as development teams and companies are reviewed. Funding of software within a company, managing software projects, investment / training of existing employees, hiring practices, investment in development systems, and organizational costs are considered. The advantages of table driven problem solvers including decision tables are considered. Existing software development practices for corporations and projects will be considered.

Additional department goals supported by this course include: a) developing a strong technical foundation in the computational sciences, b) an understanding and sensitivity for professional ethics, c) appreciation for the need to pursue professional and related learning activities for life. Students are expected to: a) employ quantitative (mathematical) evaluations in seeking optimal problem solutions, b) maintain and increase their professional knowledge/skill sets, c) develop their ability to express abstractions in the form of algorithms in the frame work of established software engineering practice and d) to extend the discipline through original cognitive processes.

Successful completion of an ambitious group project including specification, design, implementation, documentation and presentation is required. Written and oral reports are required of every class member. Written material will be graded for grammar, spelling, and style as well as technical content, completeness, and accuracy**. Individuals who do not actively participate in all phases of the group project should expect to repeat the course!** Oral reports should utilize appropriate support materials including presentation software.

Student evaluations will be used extensively in determining the grade on the group project. Students will be required to evaluate the performance of their peers. This is an advanced class. The ability of the student to design and implement large scale client / server software utilizing remote access database technology is a prerequisite or must be mastered by the student on their own time. The ability to program is assumed, not taught in this class.

Text: No text is required for this course. All material utilized in class are available on Blackboard or the "T" drive (possibly older). Students are urged to make a copy of the class notes in facilities operated by university Computer Services or view them online during class. Consider the advantages of having a bound copy of the notes to write on during class. You may access notes online during class if preferred. The instructor retains all copyright privileges to instructional materials. Students registered for the class are authorized to make a copy of instructional material for their own use to complete the course. Instructional materials may not be distributed in part or whole to others without the expressed written approval of the instructor.

A large number of text are covered during the class. Authors, titles, and additional information will be made available at the appropriate time in case the student desires to obtain the actual source material for their private collection. Additional reading/research materials will be introduced during class for those wishing to expand their education.

Required Supplies: None.

Option Texts / Supplies: It is convenient but not necessary to have your own computer and software. Access to free, inexpensive, and commercial suggested software is available on Blackboard.

Attendance Policy: Students are encouraged to attend all classes, but absences will not be used in computing the course grade. *A zero will be recorded for all work missed due to absence unless arrangements to complete missed work are made prior to the class that is missed.* The University does request we report when students miss or stop attending class.

Assignments: All assignments are posted on Blackboard. It is the student's responsibility to check Blackboard sufficiently often to obtain class assignments. New course materials are also made available to students via Blackboard. Assignments and other notifications are frequently emailed via Blackboard to "university email accounts" of students officially registered for the course. Private email accounts will not be utilized for course communications.

Tentative test dates:

MWF: Friday February 16, Friday March 23, Friday April 20 and the comprehensive final exam.

Grading: Three to four equally weighted exams will be administered during the semester including the final exam. Exams will constitute 60% of the course grade. The final exam will be comprehensive. Other assignments including the group project etcetera will constitute the remaining 40% of the grade. Student

evaluations will be used extensively in determining individual and the overall grade on the group project. In the event a student scores higher on the final exam than one of the regular tests, the lowest regular test grade, will be dropped and the grade on the final exam doubled, provided that all other assignments, especially the group project, have been completed with a grade of 70 or higher. The scale of A = 90-100, B = 80-89, C = 70-79, D = 60-69, F= below 60 will be used.

Extensive use of essay questions is made on exams. Students will be expected to extend concepts developed in class and express original ideas.

Assignments are due at the start of class. Once class starts, anything turned in will be graded as "late" work. Assignments given to the departmental secretaries, placed in my mailbox, etc., will not be graded. All work must be given to me personally. Late work is subject to a penalty of zero to ten points per period it is late (at the discretion of the instructor). No credit will be allowed for late assignments that specifically state they may not be submitted late or submitted after the specified deadline. As your employer I desire and expect your best effort.

Academic Integrity: All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

Assignments made form one semester to the next are similar of necessity. Assignments are developed with the goal of providing a student with the opportunity to develop the desired level of intellectual achievement while not over burdening the student with excessive work. The use of work done by other students past or present will be construed as cheating. "Any" verifiable instance of cheating will normally result in a grade of "F" for the course for all individuals involved. Students should not have in their possession labs or tests belonging to other students from the current or previous semesters.

Students from previous semesters providing materials to students in following semesters will be subject to all disciplinary actions provided by the university.

Classroom Rules of Conduct: University policy states students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the University. Cellular telephones and other disruptive devices must be turned off prior to the start of

class. Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive will be subject to removal by University Police and / or reported to the Dean of Students for disciplinary action in accordance with university policy.

Visitors in the Classroom: Permission to visit is at the discretion of the instructor. In general, individual wishing to visit a class must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. Deviation for these guidelines is at the sole discretion of the instructor.

Religious Holidays: Students wishing exception for religious holidays must meet all university guidelines and deadlines listed in the catalog, calendar, and university policy at http://www.shsu.edu. In general all test and work to be missed must be completed prior to the absence.

STUDENTS WITH DISABILITIES POLICY:

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities.

A complete listing of the university policies is available on the web.

Updated: December 12, 2017