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| CSC 510 Software Engineering |

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| This course will be highly interactive and proactive participation of the students is expected. This course also will bring a wealth of industrial experiences that the instructor will provide. A detailed discussion on software life cycle models, software project planning and monitoring and control, software requirements development and requirements management, software size and effort estimation, risk management, formal technical and peer reviews, software architecture, software design, software development, verification and validation methods, software configuration management and change control, the Capability Maturity Model Integration, SWEBOK, software process improvement. Emphasis is given on Software Engineering principles and how they are utilized in industry. The course will provide many opportunities to practice Software Engineering principles as they are implemented in industry. A Final project will be required for the course. The project can be either a research paper or if there are enough students interested in the development of an architectural prototype with demo (this option is only available if there are enough students interested, especially as this is an EOL course.). The course is equivalent to three (3) credit hours. |  |
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| Prerequisite |  | The student taking this course is expected to be well versed in the software development activity, programming concepts, and is expected to have developed software programs in the past. Undergraduate courses in different programming language(s), data structures, databases, numerical programming, applied discrete mathematics, computer organization and the principles of operating systems are highly desirable. |
| **Course Objectives** |  | This is a course that discusses the processes and methods required for developing and managing high quality software and software-intensive products. Students taking the course will be able to have a systematic understanding of methods, approaches, and techniques for designing, developing, and evolving high quality software and software-intensive products. Students will learn the principles and practical skills needed to deliver high-quality software, on budget, and on schedule. The methods studied are those specified in the Software Engineering discipline and include project planning, project monitoring and control, requirements development, requirements management, software architecture and design, verification, validation, process and product quality assurance, managing software outsourcing, as well as a variety of software development lifecycles used in industry. Students will also be presented with the opportunity to experience how the principles discussed are applied to the development of software in industry. At the end of the course students will be capable of fully understanding the theory behind Software Engineering principles and also know how to apply them in practice. Numerous industry examples will be provided. |
| **Course Requirements** |  | The class will be subdivided into groups/teams of 4-5 students for the purpose of developing assignments and final project. A general topic for the assignments and final project will be voted by the class.  The course will consist of the following work elements:  HOMEWORK: Three (3) Assignments. First Assignment will be individual. Second and third assignments will be in groups.  EXAMINATIONS: Two (2) Exams: (Mid-term and Final).  FINAL PROJECT: Development of a software prototype that will be produced in groups.  QUIZZES: Questions given by the instructor to the students throughout the semester that will contribute to the course grade. |
| **Textbook** |  | **The recommended textbook for this course is Pressman and Roger** (please see below). Class notes/presentations, papers, and a reading list are also utilized materials during the course.  Pressman, Roger S. and Maxim, B. Software Engineering—A Practitioner’s Approach, McGraw-Hill Science/Engineering/Math, Ninth edition, 2020, ISBN10: 1259872971.  Class notes will be made available to students |
| Instructor |  | **Dr. Aldo Dagnino**  North Carolina State University  Department of Computer Science  and  Global ABB IS Advanced Analytics Manager  ABB Inc., 305 Gregson Drive  Email: [adagnin@.ncsu.edu](mailto:adagnin@.ncsu.edu%20) |