

**1. Course number and name**

CptS 421: Software Design Project I [CAPS]

**2. Credits and contact hours**

3 credits, 3 lecture hours

**3. Instructor's or course coordinator's name**

Aaron Crandall

**4. Textbook, title, author, and year**

B. Bruegge and A.H. Dutoit. 2010. *Object Oriented Software Engineering Using UML, Patterns and Java* (3rd ed.). Prentice Hall. ISBN: 978-0136061250. (Optional)

R. Pressman. 2005. *Software Engineering: A Practitioner's Approach* (6th ed.). McGraw Hill. ISBN: 978-0071238403. (Optional)

Berkun. 2008. *Making Things Happen: Mastering Project Management (Theory in Practice)*, O'Reilly Media. ISBN: 978-0596517717. (Optional)

P.C. Jorgensen. 2008. *Software Testing: A Craftsman's Approach* (3rd ed.). Auerbach Publications. ISBN: 978-1466560680. (Optional)

*Other supplemental materials*

IEEE Standards for Software Engineering.

Scott Berkun's Blog on software engineering and project management addressing creativity, leadership, philosophy, and speaking: <http://scottberkun.com/blog/>.

**5. Specific course information**

a. *Catalog description:* Large-scale software development including requirements analysis, estimation, design, verification and project management.

b. *Prerequisites or corequisites:* C or better in CPT S 321 AND 322; or C or better CPT S 322 AND CPT S 360 or 370; or C or better CPT S 322 AND concurrent enrollment in CPT S 360 or 370; certified in Computer Sci, Computer Engr, Electrical Engr, or Software Engr.

**6. Specific goals for the course**

By the end of the course, students will be able to

- Identify, formulate, analyze and solve complex computing and software engineering problems by applying principles of engineering, computing, science, mathematics, and other relevant disciplines (1a-e).
- Design, implement and evaluate computing solutions that meet specified requirements with consideration of public health, safety, and welfare concerns, as well as global, cultural, social, environmental, and economic factors (2a-g).
- Communicate effectively with a range of audiences in a variety of professional contexts (3a-f).
- Recognize ethical and professional responsibilities in software development and make informed judgments based on legal and ethical principles, and with consideration of global, economic, environmental, and societal impacts (4a, b, d, f).

- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives (5a-g).
- Apply appropriate computing and engineering approaches, theories, and fundamentals to conduct appropriate experimentation, analyze and interpret data, use engineering judgment to draw conclusions, and produce solutions (6a-d).
- Acquire and apply new knowledge as needed, using appropriate learning strategies (7a-g).

**7. Brief list of topics to be covered**

- Project management
- Engineering solutions for real world open-ended problems
- Communication with clients, mentors, teammates, and collaborators
- Team-based software development
- Tools for software development and testing
- Collaboration tools for professional software development such as Git
- Writing technical documents