

1. Course number and name

CptS 322: Software Engineering Principles I

2. Credits and contact hours

3 credits, 3 lecture hours

3. Instructor's or course coordinator's name

Haipeng Cai

4. Textbook, title, author, and year

R. Pressman. 2009. *Software Engineering: A Practitioner's Approach*. (7th ed.).

McGraw-Hill. ISBN-10: 0073375977.

F.P. Brooks, *The Mythical Man-Month: Essays on Software Engineering, Anniversary Edition*. Addison-Wesley Professional. ISBN-10: 0201835959.
(Optional)

I Sommerville. *Software Engineering* (9th ed.). Addison-Wesley. ISBN-10: 0137035152. (Optional)

5. Specific course information

a. *Catalog description*: Introduction to software engineering; requirements analysis, definition, specification including formal methods; prototyping; design including object and function oriented design.

b. *Prerequisites or corequisites*: Certified major in CptS, CE, EE, or SE, have finished CPT S 223 with a C or better or CPTS 233 with a C or better.

6. Specific goals for the course

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

- Describe software process including the generic process framework and common instances of the framework (classical and modern process models), and choose appropriate process for a given project (1a, 2a, 6a, 7a, 7b, 7c, 7d, 7e).
- Explain key concepts on and apply the methodologies for requirements engineering, design engineering, quality assurance, risk control, and software project management (1a, 1b, 1c, 1d, 1e, 3a, 3c, 3e, 5b, 5d, 5f, 5g).
- Elicit and model software requirements, describing different elements (use cases, data/control flow, analysis classes, and system behaviors) of a requirements model using UML (1b, 1c, 1d, 3a, 3c, 3e, 5b, 5d, 5f, 5g).
- Gain skills in deriving software design, describing various design models (data objects, user interface, components, architecture, deployment) using UML (2a, 2b, 2c, 2d, 2e, 5b, 5d, 5f, 5g).
- Develop a basic understanding of software testing strategies and the preliminary skill in writing test cases (6a, 6b, 6c, 6d, 5b, 5d, 5f, 5g).

7. Brief list of topics to be covered

- Introduction to software engineering
- Software life cycle and process model

- Agile development
- Software practices
- Software requirement engineering
- Requirements modeling
- Software design engineering
- Architectural and component-level designs
- User interface design
- Quality management
- Software testing strategies
- Software testing techniques
- Software project management