

***CSE 4610 Requirements Engineering (3 credits)***

**Primary instructor:** Cem Kaner

**Supporting instructor:** Keith Gallagher

**Textbooks and references:**

S. Robertson, Mastering the Requirements Process, 2nd edition. USA: Addison-Wesley Publishing Company, 2006. (T)

**Course information:**

**2014–2015 Catalog description:** CSE 4610 Requirements Engineering (3 credits). Studies in depth software requirements engineering tools and techniques. Includes gathering user requirements, formal specification of system behavior, system interfaces, end user and system documentation and validation techniques. Emphasizes the end-user aspect of gathering and formalizing user expectations. Prerequisites: CSE 2410.

**Prerequisites by topic:** Knowledge of the software life-cycle, feasibility, and requirements as gained in the prerequisite course and through the development of software.

**Place in program:**

**Computer Science Program:** Advanced elective

**Software Engineering Program:** Required

**Course outcomes & related student outcomes:** The student will be able to

1. Explain the role of requirements engineering in the software development life cycle. (1: Fundamental knowledge)
2. Identify and interpret requirement goals and stakeholder views. (4b: Satisfaction of requirements)
3. Demonstrate the ability to discover domain system constraints and elicit requirements. (4b: Satisfaction of requirements)
4. Employ methods to identify and analyze functional and non-functional requirements. (4: Apply mathematical, scientific, algorithmic, and theoretical principles, to model, design and evaluate software systems and processes)
5. Demonstrate the ability to represent requirements from elicitation and analysis. (4b: Satisfaction of requirements)
6. Demonstrate the ability to manage and maintain requirements. (4b: Satisfaction of requirements)

**Topics covered:**

1. Requirements basics (3 hours)
2. Requirements engineering justification – overview of research (1 hour)

3. Requirements elicitation (stakeholders, system business case, multiple viewpoints of the system, system function, scenarios/threads/use cases, system performance, constraints [domain, organizational, and political], system operating environment, and recording rationale) (6 hours)
4. Requirements analysis (system boundaries and types of analyses) (3 hours)
5. Requirements specification (3 hours)
6. Requirements validation, inspections, and prototyping (3 hours)
7. Requirements management and traceability (tagging, management policies, traceability, change management, costly, and volatile requirements) (3 hours)
8. Capability maturity models, requirements engineering life cycles (requirements engineering in the software capability maturity model [CMM], requirements engineering in the integrated CMM, and requirements engineering in different lifecycles) (3 hours)
9. Requirements in critical systems (critical systems terminology, hazard analysis, and derived safety requirements) (2 hours)
10. Structured methods (behavior, dynamic, structural models, and data dictionaries) (3 hours)
11. Requirements engineering in different business situations (2 hours)
12. Requirements engineering in practice (2 hours)

**Approved by:** Cem Kaner, Professor & Heather Crawford, Assistant Professor

Signature:  Date: 2/2/15

Signature:  Date: 10 F 15