

SFE 4040: SOFTWARE REQUIREMENTS & ESTIMATION

Prerequisite: APT 2080: Introduction to Software Engineering

3 Credit Units

Rationale

A requirement gathering is the cornerstone of any software development project. In this course, students will gain the knowledge and skills needed to capture software requirements using clearly defined processes. They will learn to specify user and system requirements, match the process to the size of the software project, and apply quality and consistency tests to the requirements model. It will equip the students with skills and knowledge in developing, leading, designing, testing or managing a requirements initiative for a software system.

Course Description

The course covers essential aspects of software requirements; elicitation technique, requirements analysis; software quality attributes; software requirements management principles and practices. Software estimation components, size estimation. Effort, schedule and Cost Estimation models. Tools for Requirements Management and Estimation Requirements Management Tools

Course Learning Outcomes

At the end of the course, students will be able to:

1. Demonstrate essential software requirements
2. Describe requirement analysis process of software from engineering perspective
3. To perform cost estimation using estimation models like COCOMO
4. Apply different tools used for software management and estimation

Course Content

Software Requirements: What and Why Essential Software requirement, Good practices for requirements engineering, Improving requirements processes, Software requirements and risk management.

Software Requirements Engineering Requirements elicitation, requirements analysis documentation, review, elicitation techniques, analysis models, Software quality attributes, risk reduction through prototyping, setting requirements priorities, verifying requirements quality,

Software Requirements Management Requirements management Principles and practices, Requirements attributes, Change Management Process, Requirements Traceability Matrix, Links in requirements chain UNIT IV Software Requirements Modeling Use Case Modeling, Analysis Models, Dataflow diagram, state transition diagram, class diagrams, Object analysis, Problem Frames.

Software Estimation Components of Software Estimations, Estimation methods, Problems associated with estimation, Key project factors that influence estimation Size Estimation Two views of sizing, Function Point Analysis, Mark II FPA, Full Function Points, LOC Estimation, Conversion between size measures,.

Effort, Schedule and Cost Estimation What is Productivity? Estimation Factors, Approaches to Effort and Schedule Estimation, COCOMO II, Putnam Estimation Model, Algorithmic models, Cost Estimation .

Tools for Requirements Management and Estimation Requirements Management Tools: Benefits of using a requirements management tool, commercial requirements management tool, Rational Requisite pro, Caliber ‘ RM, implementing requirements management automation, Software Estimation Tools: Desirable features in software estimation tools, IFPUG, USC’s COCOMO II, SLIM (Software Life Cycle Management) Tools

Teaching Methodology

The course will be taught by lecture, group work, exercises, and demonstrations (labs)

Instructional material & equipment

Textbooks, whiteboard, handouts, electronic projector and laptop, Internet access, software and the library.

Method of evaluation

Class assignments, take-home assignments, tests, small projects to demonstrate use of software tools

Laboratory Work	20%
Project	20%
Assignments	10%
Mid-semester	20%
Final semester exams	30%
Total	<u>100%</u>

Course Text

Software & Systems Requirements Engineering: In Practice by Brian Berenbach, Daniel J. Paulish, Juergen ... – 2009

Engineering and managing software requirements by Aybüke Aurum, Claes Wohlin – 2005

Requirements Engineering: Foundation for Software Quality: by Martin Glinz, Patrick Heymans - 2009