

# **CSE 5324: Software Engineering I**

## **(Analysis, Design, Creation)**

**Review**

**Preview**

**Brooks Book Chapter**

**New stuff**

**What is important**

**What is next...**

**Last class:**

**Rational**

**Terms**

**Motivation**

**Life of a Software Project**

## **Preview:**

**Software development**

**Life Cycles**

**Paradigms**

**What does a manager do?**

**Requirements**

**Success and failure in software projects**

**Fred Brooks**

**Software Engineering**

**People Months and Reality**

**The Book (that EVERYONE has, and some read)**

# **Developing Software Projects**

**Software development life cycles**

**How does one (team) develop software ?**

## **Process and Life Cycle**

**None (probably "Code and Fix")**

**Waterfall**

**Prototype**

**Incremental**

**Spiral**

## Introduction and some review:

Analysis - break into understandable pieces

Synthesis - put small pieces (blocks) together to create large system

Method (or technique, step) - formal way (step) to produce a result  
(a step to cook...)

Tool - automated system (instrument) to do something better

Procedure - recipe to combine methods and tools

Paradigm - a cooking style or philosophy

Software development includes:

Analysis and definition of requirements

System and program design

Coding

Testing: Unit, integration, system

Maintenance

A process model puts these into some order

None (Code + fix)

Waterfall

Prototype

Verify Waterfall - "V" model

Operational specification - execute requirements to demo behavior

Transformational model - formal definition transformed to implementation

Incremental model

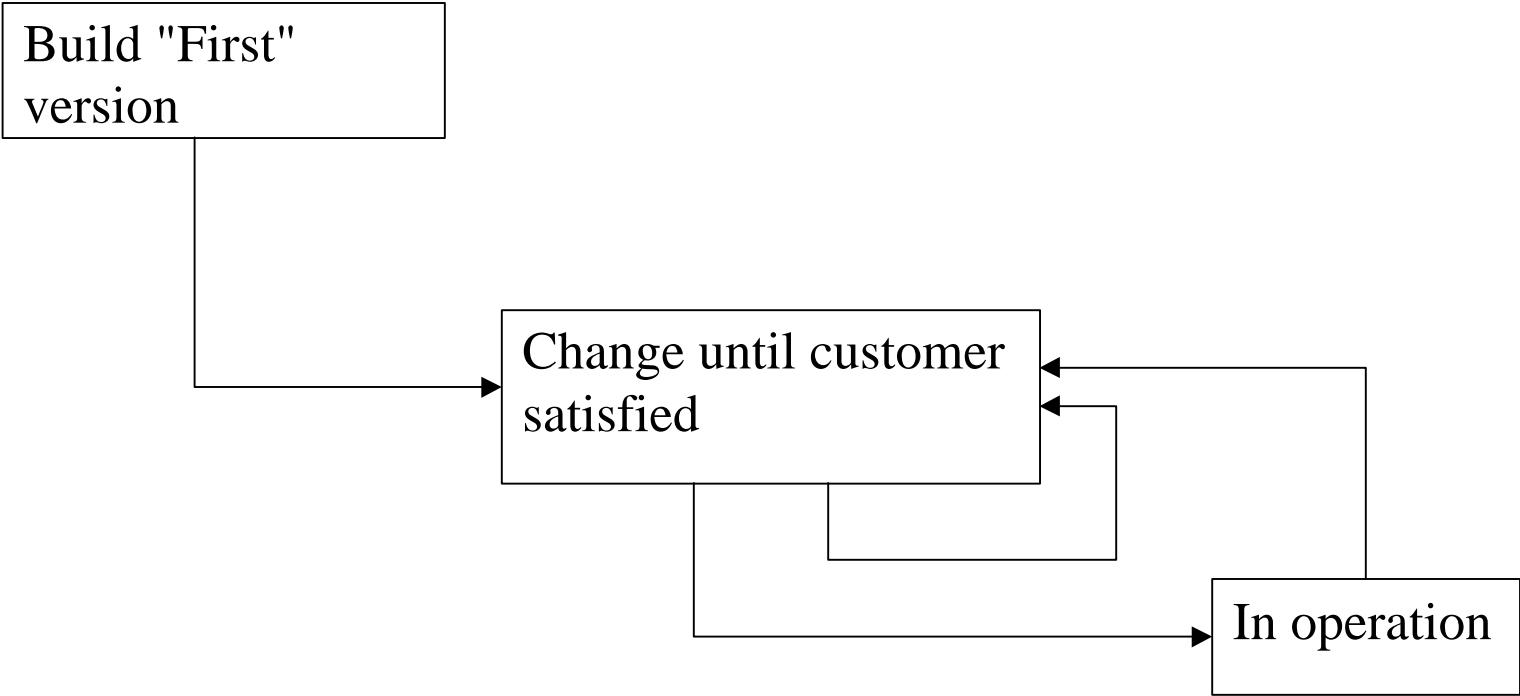
Spiral

Process modeling can be textual (words) or graphic (or both)

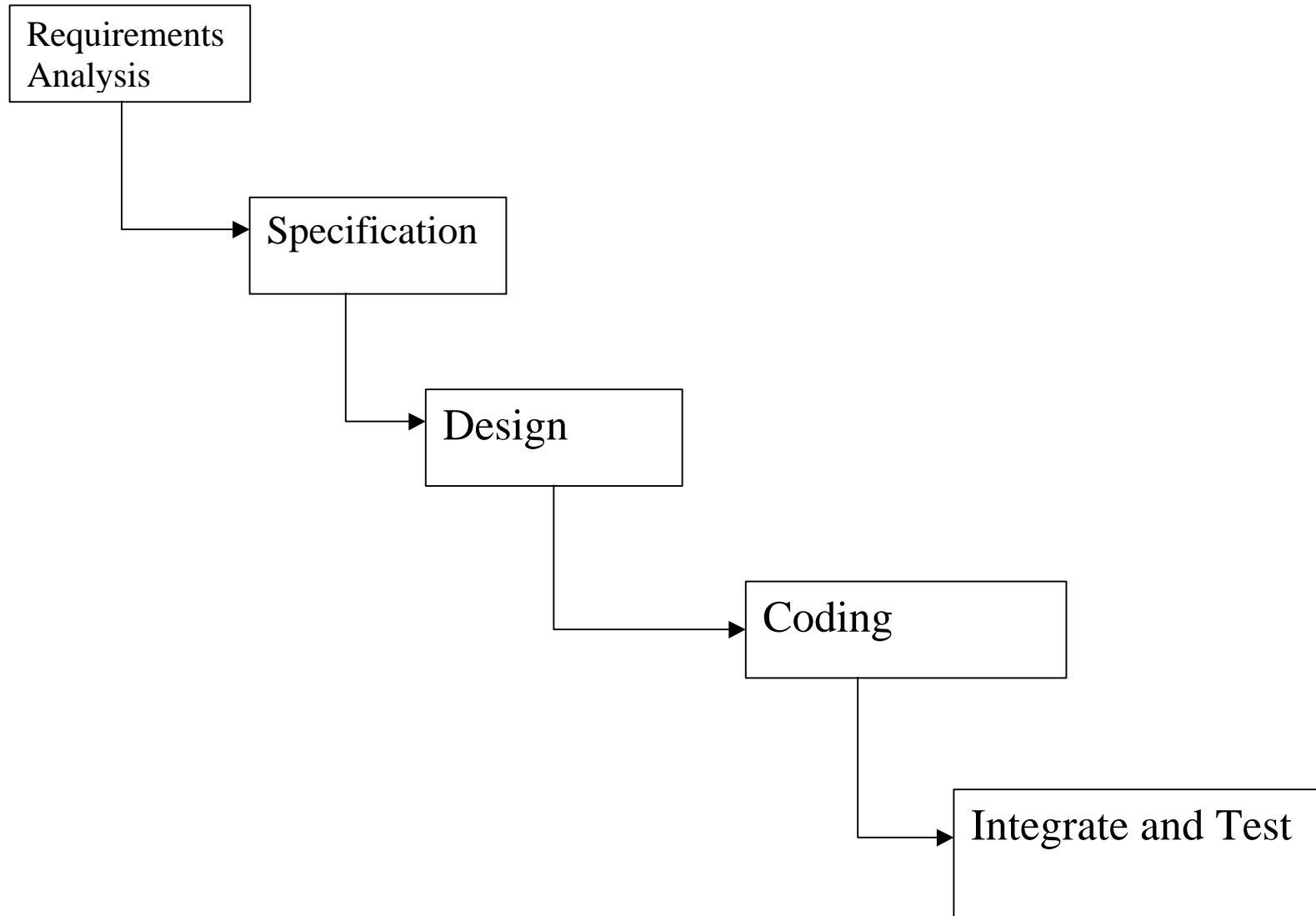
Models be static - inputs transformed to outputs or

dynamic - see intermediate products and how it works over time

# Code and Fix (Build and Fix)



# Waterfall





# CMM (Capability Maturity Model)

## SEI (CMU) developed CMM

	Level	Focus	Key Practices (KPA)
1	Initial		
2	Repeatable	Mgmt responsibility	Training, staffing, SQA, planning
3	Defined	Organization	Career develop, training, process def.
4	Managed	Measured	Organizational, teams, Quantitative
5	Optimizing	Continuous	Improvement, defect prevention

## CMM (Capability Maturity Model)

(Model for a 200,000 line product)

Level	Duration (Cal months)	Effort (Person m)	Faults (Develop)		Cost of Development (Installed)
1	29.8	593.5	1,348	61	\$5,440,000
2	18.5	143.0	328	12	\$1,311,000
3	15.2	79.5	182	7	\$728,000
4	12.5	42.8	97	5	\$392,000
5	9.0	16.0	37	1	\$146,000

# Requirements

# Models of software development (Life cycles)

Waterfall (linear sequential)

Prototype

Incremental

Spiral

Cleanroom

