



# Introduction to Software Testing

## Revisiting the RIPR Model

**Software Testing & Maintenance**

SWE 437

<http://go.gmu.edu/swe437>

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# Software faults, errors, & failures

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**Software fault:** A static defect in software

**Software failure:** External, incorrect behavior with respect to the requirements or other description of the expected behavior

**Software error:** An incorrect internal state that is the manifestation of some fault.

**Faults in software are analogous to design mistakes in hardware.**

**Software does not degrade.**

# Fault & Failure Model (RIPR)

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## Four conditions necessary for a failure to be observed

1. **Reachability:** The location or locations in the program that contain the fault must be reached
2. **Infection:** The state of the program must be incorrect
3. **Propagation:** The infected state must cause some output or final state of the program to be incorrect
4. **Reveal:** The tester must observe part of the incorrect portion of the program state.

# RIPR Model

**R**eachability  
**I**nfection  
**P**ropagation  
**R**evealability

