


CS314: Exam 2 Review


James M. Bieman



CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-1

Exam Format


- Closed book closed notes.
- However, you may bring one sheet of 8.5 x 11 inch paper with your notes on both sides of the page. You must put your name on the sheet and turn it in with your exam.
- Draft Exam (subject to change):
 1. 8 Multiple choice questions (24 points).
 2. 4 Short answer questions. (24 points).
 3. 2 problems related to the Adventure Game design (25 points).
 4. 2 problems related to domain/conceptual modeling of the problem space (27 points).



CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-2

Exam Topics Material Since Exam 1

- Software Design & Architecture
 - Notes 4 & text Ch. 5-7, 12
 - Assignment 4: Android Adventure Game design & implementation.
 - Assignment 5: Design Pattern Adventure Game Enhancements.
- User interface design
 - Notes from Geri Georg's lecture & text Ch. 13.
- Requirements
 - Notes 5, text Ch. 10, 14 (sec. 8.1 sequence diagrams), Ch. 12 Modeling with classes (domain models).
 - Design Studio 6: Domain Modeling.




CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-3

Topics on Exam: Notes 4, Text Chapter 5, 6 & 9

Architecture & Design for OO Software

✧ Assignment 4: Android interface.


- Process of software design.
 - Software design: a model of a system.
 - Model derivation at levels of abstraction.
 - Move from informal design to formal program solution.
 - Models expressed in graphical, formal, or other notations.
 - Phases: system architecture, architectural design, interface design, component design, algorithm design.



CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-4

Topics on Exam: Notes 4


- Design Assessment.
 - Design quality Goals: efficient, cheapest, maintainable.
 - Design principles [Davis]:
 - Consider alternatives.
 - Don't reinvent the wheel.
 - Minimize intellectual distance.
 - Uniformity.
 - Changeability.
 - Degradable.
 - Reviews.



CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-5

Topics on Exam: Notes 4


- Component assessment
 - Component parts: interface (contract) and secrets.
 - Component design quality.
 - Cohesion: aim for strong cohesion.
 - Coupling: aim for weak coupling.
 - Understandability.
 - Good names.
 - Accurate documentation.
 - Avoid complexity!!



CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-6

**Topics on Exam:
Notes 4**

- Architectural structures.
 - Hierarchical (tree) structures.
 - Pipeline architectures: compilers.
 - Layered: operating systems.
 - Client/server.
- Control options.
 - Centralized.
 - Broadcast event-driven.
 - Interrupt driven.




CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-7

**Topics on Exam:
Notes 4, Text Chapter 12**

Design patterns: design experience.

✧ Assignment 5: Design patterns and enhancements.

- Pattern structure.
- Patterns:
 - Façade.
 - Model-View-Controller.
 - Abstract Factory.
 - Broker.




CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-8

Notes 5, Text: Ch. 10, 14 (Sec. 8.1)

OO Requirements Analysis.


- Overview:
 - Informal problem domains.
 - Functional and non-functional requirements.
 - Problem definition and the need for precision.
 - Prototypes for requirements definition.
- Requirements documents.



CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-9

Notes 5, Ch. 4 Requirements


- Use-case analysis.
 - Actors.
 - Scenarios: Typical and alternative course of events.
 - Use-case diagrams.
 - Identify use cases: actor or event based approach.



CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-10

**Notes 5 OO Requirements
Text Sec. 8.1**

- System sequence diagrams.
 - Depict sequence of actions between actors and the system.
 - Generate from use case scenarios.
 - System event: input event generated by an actor.
 - System operation: response to a system event.




CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-11

**Notes 5 OO Requirements
Notes 5, Ch. 11**

Design Studio 6: Domain/Conceptual modeling.

- Identify concepts and their attributes.
 - Concepts tend to be nouns; objects pronouns.
 - Attributes: information held by objects.
- Determine associations and generalizations.
Look for collaborators.



CSU CS314 Copyright © James M. Bieman 2015-16 Exam 2 Review-12

Notes 5, Text: Ch. 10

- Evaluating requirements.
 - Unambiguous.
 - Verifiable.
 - Consistent.
 - Complete.
 - Should not dictate a particular design.
 - Use cases: end-to-end, named with verb phrase.
 - Domain/conceptual model: a domain concept (class) is named with a noun phrase; needed information made available through attributes or associations.
 - Non-functional requirements must be testable.