SEG 2105 - FINAL EXAM

INTRODUCTION TO SOFTWARE ENGINEERING

Pay Attention, Read Carefully

What's OUT

- Section 4.8, 4.9, 4.10, 4.11, 4.12
- Section 6.14
- Chapter 7
- Communication diagrams (Chapter 8)
- Section 10.3 - 10.8
- Concepts related to Android development.
- Question involving Umple code (and/or syntax).

KEYWORDS (FOR MULTIPLE CHOICE QUESTIONS

- Chapter 4: requirement, non-functional (process, platform, quality), functional, use case, use case diagram, extends-includes relationships
- Chapter 5: attributes, associations, system model vs domain model, reflexive associations, association classes, composition, multiplicity, operation, directionality.
- Chapter 6: Delegation, observer, factory, abstraction-occurrence, player-role, proxy, heavy-weight, general-hierarchy, singleton, adapter, immutable, read-only, factory;
- Chapter 8: activity, event, transition, guard condition, states, concurrency, fragments, alt, opt, par, loop, composite (nested states);
- Chapter 9: design space, system, component, module, top-down, bottom-up, divide and conquer, cohesion (all types), coupling (all types), abstraction, reusability, flexibility, portability, testability, design by contract, package diagrams, deployment diagrams, component diagrams, layered architecture, broker, pipe-filter, MVC, transaction processing, service-oriented.
- Chapter 10: failure, error, defect (bug), black-box vs white box testing, control flow-graph, coverage (paths, nodes, edges), equivalence class, boundaries.

HOW TO STUDY

- Chapter 4: Review slides and notes taken in class. You need to know how to write a 'good' requirement (non functional or functional) and know how to categorize different types of requirements.
- Chapter 5: Review slides and notes taken in class AND read the entire chapter from the textbook.
- Chapter 6: Review slides and notes taken in class.
- Chapter 8: Review slides and notes taken in class AND read the entire chapter from the textbook. Review examples done in class.
- Chapter 9: Review slides and notes taken in class AND read the entire chapter from the textbook. Review examples done in class.
- Chapter 10: Review slides and notes taken in class

Contents of the final exam

- **Part 1:** Exam will include 32 fill-in-the-blank and multiple choice questions (selected from the keywords listed before) and
- **Part 2:** Pick 5 out of 7 questions.
    - Chapter 4, 5,6,8: You will have to write different UML diagrams (use case, sequence, state, class).Patterns will need to be identified in the design and you may need to write OCL constraints and requirements.
- **Cheat Sheet:** You can bring a Cheat-sheet to the exam, written by hand or by computer, double-sided, 8.5" x 11". Coloured or in black.

Cheat Sheets can't help you learn concepts

- You can bring a Cheat-sheet to the exam, written by hand or by computer, double-sided, 8.5'' x 11''.
- Coloured or in black.
- The exam is not a time to learn the material for the course
  - Multiple choice will be an application of the material
  - NOT (just) definitions
- IMO, focus on examples, justifications, scenarios and specifics
  - Instead of just definitions
  - Include *sample* designs that should all facets of a solution

Pay Attention to the structure

- Part 1: Multiple Choice / Short Answer
  - 32 fill-in-the-blank
  - Multiple choice questions
- Part 2: Design (Long Answer)
  - Answer 5 out of 7 questions
  - DO NOT answer more than 5
  - DO answer any/all mandatory questions

Just because we say something might be on the exam, do not be upset if it isn't

And don't be upset if it is!

What's Out!!!

- Section 4.8, 4.9, 4.10, 4.11, 4.12
- Section 6.14
- Chapter 7
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- Section 10.3 - 10.8
- Concepts related to Android development.
- Question involving Umple code (and/or syntax).

Professor(s): Garzón, Forward and El-Sawah

December 2019, duration: 3 hours

Identification

Student name: _____

Student number: _____ Section: (A) (B) (C) Signature: _____

Instructions

1. Read all the directives carefully;
2. **A double-sided cheat-sheet (8.5”x11”) is allowed;**
3. No calculators, electronic devices or other aids are permitted;
4. Any electronic device or tool must be shut off, stored and out of reach;
5. If you don’t understand a question, state an assumption;
6. Write comments and assumptions to get partial marks;
7. Write your answers in the space provided.
8. You may not hand in additional pages;
9. You can remove the last page of this examination;
10. Beware, poor hand writing can affect grades;

Marking scheme

Question	Maximum	Result
Part 1	39	
Part 2	61	
Total	**100**	

SEG 2105 - PART 1

Multiple Choice / Short Answer

Chapter 4 – Requirements

- Requirement,
  - non-functional (process, platform, quality),
  - functional,
- use case,
- use case diagram,
  - extends / includes / generalizations
  - actors

Chapter 5 – UML Static Models

- attributes,
- associations,
- system model vs domain model,
- reflexive associations,
- association classes,
- composition,
- multiplicity,
- operation,
- directionality

Chapter 6 – Patterns

- Delegation,
- observer,
- factory,
- abstraction-occurrence,
- player-role,
- proxy,
- heavy-weight,
- general-hierarchy,
- singleton,
- adapter,
- immutable,
- read-only,
- factory

Chapter 7 – Usability

- Good for your career, but won't help you on the final exam
- (This is one of the excluded chapters, remember)

Chapter 8 – UML Behaviour Models

- activity,
- event,
- transition,
- guard condition,
- states,
- concurrency,
- fragments,
  - alt,
  - opt,
  - par,
  - loop,
- composite (nested states);

Chapter 9 – Design

- Design space,
- system,
- component,
- module,
- top-down,
- bottom-up,
- divide and conquer,
- **cohesion (all types),**
- **coupling (all types),**
- abstraction,
- reusability,
- flexibility,
- portability,
- testability,
- design by contract,
- package diagrams,
- deployment diagrams,
- component diagrams,
- layered architecture,
- broker,
- pipe-filter,
- MVC,
- transaction processing,
- service-oriented.

Chapter 10 – Testing

- Failure,
- error,
- defect (bug),
- black-box vs white box testing,
- control flow-graph,
- coverage (paths, nodes, edges),
- equivalence class,
- boundaries.

SEG 2105 - PART 2

Design / Development Questions

Don't start with the diagram...

- List out the major components (a list)
- Group related things (cohesion, good!)
- Separate unrelated things (cohesion, good!)
- Don't over-engineer
  - Simplify
  - But, not too much
  - Err assumptions on the simpler side

Stop, don't start with the diagram

- All design questions can be answered by
  - Finding good names for things
  - Putting like things together
  - Simplifying
  - And then "drawing"

Chapter References

- Chapter 4, 5,6,8
- UML Diagrams
  - Use Case Diagram
  - Sequence
  - State
  - Class
  - Others …
- Software patterns
- OCL constraints
- Requirements and Use Cases (Use Case != Use Case Diagram)

SEG 2105 - THOUGHTS ON HOW

TO STUDY

Listen to all the hints and suggestions we are giving you

- We are not giving you everything
- But, we do give you a lot
  - Yes, study outside of the strict “suggestions” above
  - But, don’t neglect them!!!

Write (with a pen / pencil) and then write some more

- Don't just read, write
- Write a lot
- First, start by writing out the notes
  - 2018 notes are more verbose
  - 2019 try and "write" your own lecture based on the slides
- Second, start designing
  - Traffic lights
  - Hopsital waiting room
  - Stock analysis tool
- Rince, repeat

Build Up your Cheat Sheet

- Powerpoint (or equivalent) might be best
- Be weary of *low quality* images and how resize
- Terms (at a minimum) are very important
- Sample solutions (the best definitions are often clear, working and correct answers)
- Why, when, where and how are important
- It's open book so what (i.e. definitions) not as relevant

Cheat Sheet Forces You To Study

- But it can't teach you during the exam
- Multiple choice will be similarly *applied knowledge*
- Some tricky, but err on the side of simplicity
- Gradient scale, the best answer wins
  - Just because there is a possible case where your answer might, maybe, just once, apply
  - Doesn't make it the best answer

Chapter 4

- Review slides (both 2019 and 2018)
- Review your notes (you did take notes right!)
- Writing a 'good' requirement
- Categorizing different types of requirements

Chapter 5

- Review slides (both 2019 and 2018)
- Review your notes (you did take notes right!)
- Chapter 5 in the book, read it!

Chapter 6

- Review slides (both 2019 and 2018)
- Review your notes (you did take notes right!)

Chapter 7

- Nothing, it's not on the exam

Chapter 8

- Review slides (both 2019 and 2018)
- Review your notes (you did take notes right!)
- Chapter 8 in the book, read it!
- Practice, practice, practice
  - Additional examples and solutions in BrightSpace

Chapter 9

- Review slides (both 2019 and 2018)
- Review your notes (you did take notes right!)
- Chapter 9 in the book, read it!
- Practice, practice, practice

Chapter 10

- Review slides (both 2019 and 2018)
- Review your notes (you did take notes right!)