

# CPE 203 Schedule

## Winter 2019

### Week 1 – 1/7 to 1/11

#### Subjects

Class introduction and logistics. Introduction to Object-oriented programming and Java. Overview of objects and classes.

#### Reading

Horstmann - skim chapters 1, 2. Study chapter 3. The language basics covered in chapter 3 won't be covered extensively in lecture, and you will need to know this material.

#### Assignments

Lab 1: Python to Java types exercise. Due Friday 1/11.

Lab 2: Implement classes, instantiate and use classes. Due Wednesday 1/16.

### Week 2 – 1/14 to 1/18

#### Subjects

Creating a class. Class names. Static methods vs. instance methods. Static fields vs. instance fields. Public vs. private. Single responsibility principle. Types. Creating unit tests with Testy.

#### Reading

- Horstmann chapter 4, but ignore section on `finalize()`.
- `info/code_conventions.txt`
- `info/git_commands.txt`
- `info/unix_commands.txt`
- `info/setup.txt`
- `info/resources.txt`

#### Assignments

Project 1: Implement `EventSchedule`. UML for elimination of `Functions`. Due Sunday 1/20.

Lab 3: Static methods vs. instance methods. Due Wednesday 1/24.

## Week 3 – 1/22 to 1/25 (no class Monday, 1/21)

### 10/8 to 10/12

#### Subjects

Supertypes and subtypes. Inheritance. Classes, abstract classes and interfaces. Polymorphism and instance methods. `instanceof`. Static initializers. Introduction to Liskov substitution principle.

#### Reading

- Horstmann sections 5.1, 5.2, 5.8, 6.1 except for 6.1.4, 6.1.5, 6.1.6.

#### Assignments

Project 2: Rewrite code to UML. Fix bug with `MINER_FULL` appearance. Due Tuesday 1/29.

Lab 4: interfaces and `instanceof`. Due Wednesday 1/30.

## Week 4 – 1/28 to 2/1

#### Subjects

Role Interfaces / interface segregation. Lambdas. Using interfaces for abstraction: Graphy. Functional interfaces. Cohesion and coupling.

#### Reading

Reading: Horstmann sections 5.3, 5.4, 5.5, 5.6, 6.2, 6.3, 6.4. We're skipping 6.5.

#### Assignments

Project 3: Introduce interfaces for actions. Introduce a new action to change the world with the seasons. Add unit test. Due Friday 2/8.

Lab 5: Lambda expressions and `java.util.Comparator`. Due Monday 2/11.

## Week 5 – 2/4 to 2/8

#### Subjects

Template method pattern. Open/closed principle. Reflection APIs: `Class.isInstance()`, `MyClass.class`

#### Reading

Horstmann, chapter 7 intro, 7.1, 7.2, 7.3, 9.2.3.

## Assignments

Lab 6: Data analysis. Due Friday 2/15.

## Week 6 – 2/11 to 2/15

### Midterm

Monday 2/11

### Subjects

Using maps to collect related data. Subtyping. Implementation inheritance and abstract classes.

### Reading

None

## Assignments

Lab 7: Inheritance (calculator). Due Wednesday 2/20.

Project 4: Introduce classes for the entities. Make `EventSchedule` more efficient. Due Friday 2/22

## Week 7 – 2/19 to 2/22 (Monday's class on Tuesday, 2/19)

### Subjects

Advanced debugging – enabling debugging, debug framework. Dependency inversion. SOLID design principles acronym.

### Reading

- DZone article on annotations -- just read the first two, about `@Override` and `@FunctionalInterface` <https://dzone.com/articles/5-annotations-every-java-developer-should-know>
- Java Tutorial on Interfaces and Inheritance: <https://docs.oracle.com/javase/tutorial/java/landI/index.html>
- Wikipedia articles on Design By Contract and Liskov Substitution Principle  
[https://en.wikipedia.org/wiki/Design\\_by\\_contract](https://en.wikipedia.org/wiki/Design_by_contract)  
[https://en.wikipedia.org/wiki/Liskov\\_substitution\\_principle](https://en.wikipedia.org/wiki/Liskov_substitution_principle)
- The SOLID acronym: <https://en.wikipedia.org/wiki/SOLID>
- Java's assert mechanism: <https://docs.oracle.com/javase/7/docs/technotes/guides/language/assert.html>

## Assignments

Lab 8: Depth first search. Due Wednesday 2/27.

Project 5: A\* Pathing. Create unit tests for pathing. Due Friday 3/1.

## Week 8 – 2/25 to 3/1

### Subjects

Generics: parametric polymorphism.

### Reading

- Horstmann: Chapter 8 intro, 8.1, 8.2, 8.3
- Pathing algorithms, A\*: [https://en.wikipedia.org/wiki/A\\*\\_search\\_algorithm](https://en.wikipedia.org/wiki/A*_search_algorithm)

## Assignments

Lab 9: generics / HashMap. Due Wednesday 3/6.

## Week 9 – 3/4 to 3/8

### Subjects

Generics and bounded polymorphism. Exceptions.

### Reading

Horstmann Chapter 8: 8.4, 8.5.1, 8.6 (skip 8.6.4, 8.6.6-8.6.10), 8.7, 8.8 (skip 8.8.4)

## Assignments

Lab 10: Streams / image. Due Wednesday 3/13.

Project 6: Extend program with new entity and other elements. Clean up entity image handling. Due Friday 3/15.

## Week 10 – 3/11 to 3/15

### Subjects

Stream processing. Design patterns revisited. Review.

### Reading

- The Strategy design pattern: [https://en.wikipedia.org/wiki/Strategy\\_pattern](https://en.wikipedia.org/wiki/Strategy_pattern)

- The Template Method design pattern: [https://en.wikipedia.org/wiki/Template\\_method\\_pattern](https://en.wikipedia.org/wiki/Template_method_pattern)  
[https://sourcemaking.com/design\\_patterns/template\\_method](https://sourcemaking.com/design_patterns/template_method)

## **Assignments**

## **Finals Week**

Office hours: Monday 2-4 PM, Tuesday 2-4 PM

Final, 3-4 PM section: Wednesday, March 20, 1 PM – 4 PM.

Final, 5-6 PM section: Monday, March 18, 4-7 PM

## **NOTES**

All due dates are at the end of the day, at 11:59 PM. A grace period is added to the due date; see `checkgit` for details.