

CISC 3115 -- Weekly Syllabus (subject to change)

Chapters are denoted in both Gaddis and Liang. All source code from the Liang textbook is available for free online.

Week 1: Unix/Linux (command line) and Review

Week 2-3: **Java class definitions** [Gaddis Ch 6, Liang Ch 9]

- instance variables
- instance methods
- constructors
- scope
- passing objects to methods
- arrays of objects

Week 4: **Object Oriented Thinking** [Gaddis Ch 8, Liang Ch 10]

- class abstraction and encapsulation
- static variables and methods
- aggregation
- UML
- copying objects
- wrapper classes (in Gaddis Ch 9)
- StringBuilder and StringBuffer Classes

Weeks 5-6: **Inheritance, Polymorphism and Dynamic Binding** [Gaddis Ch 10, Liang Ch 11 and 13]

- Superclasses and Subclasses
- Overriding and Overloading methods
- constructor chaining
- Object class, .equals and .toString
- arrays of objects with polymorphic method calls

Week 7: **Java Exception Handling** [Gaddis Ch 11, Liang Ch 12]

- try-catch blocks
- throwing exceptions
- exception types (including checked vs unchecked)
- polymorphism and dynamic binding with exceptions
- stack trace
- defining custom exception types

Week 8: **Review and Midterm Exam**

Week 9: **Abstract Classes and Interfaces**

Week 10: **Recursion** [Gaddis Ch 16, Liang Ch 18]

including Mathematical recursive functions (e.g. divide, factorial, Fibonacci numbers) and recursion used for array processing e.g. linear and binary search. Time permitting: recursive sorts.

Weeks 11-12: **Java Collection Hierarchy** [Liang Chapters 20-21]

- Including: ArrayList, LinkedList, Queue, Set (Hash and Tree), Map (Hash and Tree), Iterator
- Enhanced for loop
- Generics (including the Comparable<> interface) [Liang Section 13.6 and Ch 19]

Week 13: **GUI programming** [Gaddis Ch 12-14, Liang Ch 14]

JavaFX Applications, including basic GUI components (e.g. Button, Circle, Image) and their placement using Panes, Scenes, Stage.

Week 14: **Event Driven Programming** [Gaddis Ch 15, Liang Ch 15]

- Handling Events (e.g. ActionEvent) with EventHandler<> classes
- Inner Classes
- Anonymous Inner Classes and Lambdas

Week 15: **Final Exam** (cumulative)

Additional Topics (time permitting)

Threads and Parallel Programming [Liang Ch 32]

Network Programming [Liang Ch 33]