CMSC 113 Computer Science 1

Spring 2025

Course Overview

- Solving problems using computers
- Basic Java programming
- Object-Oriented Programming in Java
- Basic Linux

Solving Problems

- Design an **algorithm**
- Decide on program components: **variables**, **functions**, **objects**, etc.
- Numerical computation
- Computing with text
- Graphics Drawing
- Data Visualization
- Data processing from files

Basic Java

- **Data Types**

  Primitive Types: **int**, **double**, **char**, **Boolean** (+ **String**, **Color**)
  Operations: +, -, *, /, %, <, <=, >, >=, ==, !=, &&, ||, !

- **Statements**
  assignment (**a = b**), conditionals (**if-**), loops (**for-**, **while-**)

- **Arrays**

- **Functions & Parameters**

- **Libraries, APIs**

Libraries/APIs

- System
- StdIn
- StdOut
- StdDraw
- StdStats*
- In
- Color
- Picture
- Turtle*
- String
- Math

Object-Oriented Programming (OOP) in Java

```
imports
public class name {

    instance variables
    constructors
    instance methods
    print method
    static methods

    public static void main(String[] args){
        ……
    } // main()
} // class name
```

Programs

Days in a month	Converting Time	Computing ETA	Great Circle Distance
Leap Year	Odd or even number	Wind Chill	Computing ∏
Computing Average	Computing $\sqrt{a}$	Reversing an integer	Rolling dice
Data sampling	Figure Skating scoring	Birthday Match	HiLo game
Histogram	Summary Statistics	Letter Frequencies	Drawing shapes
Plotting points	Collecting sports cards	Animation	Prime numbers
Visualizing Data	Stats Library	Image Processing	Searching in texts
Verifying passwords	Creating pass phrases	Country-Capital game	Turtle graphics
Turtle Class	Place Class	Zip code search	Fraction arithmetic

Syllabus for Exam 3

- **Static Function Libraries**

  Using static function libraries
  Creating your own static function libraries

- **Object-Oriented Programming**

  Defining types, create, use objects
  Using the Color, Picture, and String classes
  Designing and creating your own types
  Public/private components

- Labs 8, 9, and 10

- Assignments 5 and 6

Where to go from here?

- Minor in Computer Science
- Minor in Data Science
- Major in Computer Science
- Not taking any more CS

Thank you!!