# CSE 141 – Introduction to Programming

## Fall 2020

This course serves as an introduction to computational problem solving using a modern programming language.

### Course Objectives

* To understand the nature of programming as human activity
* To learn and experience main components of programming process
* To understand main control structures of procedural programming languages
* To learn and being able to use major programming patterns
* To understand the principles of data storage and manipulation
* To get prepared for the more advanced programming courses such as CSE142 (Object Oriented Programming Techniques) and CSE247 (Data Structures)

### Topics

* Introduction to programming in Java: Elementary data types, control flow, conditionals, loops, and arrays.
* Input and output at console, files, as sounds, and as on-screen drawings.
* Static methods, recursion.
* Using libraries, user-defined datatypes.
* Exception handling.

### Grading (tentative)

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| Quizzes | 10% |
| Assignments | 20% |
| Lab Exam | 10% |
| Midterm Exam | 15% + 15% |
| Final Exam | 30% |

### Textbook

* Robert Sedgewick and Kevin Wayne, Introduction to Programming in Java: An Interdisciplinary Approach, Addison-Wesley, 2nd Edition, 2017. [Main text]
* Y. Daniel Liang, Introduction to Java Programming and Data Structures, 11th Edition, Pearson, 2017.

### Weekly schedule (tentative)

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| **Week** | **Topic** |
| 1 | Introduction and first Java program (Hello World!)  Compiling and executing Java programs from command-line  Input as command-line arguments |
| 2 | Data types, literals, Java expressions  Java as calculator |
| 3 | Conditionals - **if** statement  Loops - **for** and **while** statements |
| 4 | Examples - Factorization, Conversion to binary |
| 5 | Arrays |
| 6 | Nested loops  Examples – Selection Sort  2d Arrays |
| 7 | Standard Input/Output; Libraries - StdIn, StdOut, StdDraw |
| 8 | Static methods |
| 9 | Arrays as parameters and return values  Pass by value/reference |
| 10 | Recursion |
| 11 | Example: Tower of Hanoi |
| 12 | Reading/Writing text files |
| 13 | Exception Handling |
| 14 |  |