CS2613: Programming Languages Laboratory (FR01B)
Lab Cycle Topics

Cycle #1: Programming Fundamentals

#1	Python	# of Tasks: 2	11 January 2024
Lab Topics: • Variables and Data Types • Basic Math • Functions • Conditionals • Iteration • Importing Modules			
Task 1: Programming w/ Self-Assessment • Think Python 2e Chapters: ○ 1.1 – 1.5 ○ 2.1 – 2.6 ○ 5.2 – 5.4, 5.11 ○ 7.1 – 7.4			
Task 2: Programming w/ on-the-spot Grading • Think Python 2e Chapters: ○ 3 ○ 6			

#2	JavaScript	# of Tasks: 3	16 January 2024
Lab Topics: • Variables and Data Types • Basic Math • Functions • Conditionals • Iteration • Importing Modules			
Task 1: Programming w/ on-the-spot Grading • Eloquent JavaScript Chapters: ○ 1 ○ 2 ○ 3			
Task 2: Programming w/ Self-Assessment • https://www.codecademy.com/article/getting-user-input-in-node-js			
Task 3: Reflection			

#3	Racket	# of Tasks: 2	18 January 2024

Lab Topics:

- Variables and Data Types
- Basic Math
- Functions
- Conditionals

Task 1: Programming w/ on-the-spot Grading

- The Racket **Guide**
  - 2.1 – 2.3
    - Basic Math
    - Function Creation
    - Conditional Statements
  - 3.1 – 3.4, 3.8
    - Understanding of the data types
- The Racket **Reference**
  - 4.2
    - Boolean Expressions
  - 13.5
    - display versus displayln

Task 2: Tracing

- The Racket **Reference**
  - 4.6

#4	Octave	# of Tasks: 3	23 January 2024

Lab Topics:

- Variables and Data Types
- Basic Math
- Functions
- Conditionals
- Iteration

Task 1: Programming

- To run: https://octave.sourceforge.io/octave/function/run.html
- https://byjus.com/maths/unit-vector/
- GNU Octave Documentation:
  - 3
  - 4.1.1
  - 8
  - 10
  - 11
  - 17

Task 2: Programming

- GNU Octave Documentation:
  - 14

Task 3: Peer Evaluation

- Will require working with a partner. If you do not have a partner, you will be assigned one.

#5	Extra	# of Tasks: 3	25 January 2024
Lab Topics: • Reflect on Course Content			
Task 1: Self-Reflection			
Task 2: Group Discussions • Will require working with a group of 4. If you do not have a group, you will be assigned one.			
Task 3: Goal Setting			

Cycle #2: Data Structures

#6	Python	# of Tasks: 3	30 January 2024
Lab Topics: • Strings • Lists • File I/O			
Task 1: Research • Think Python 2e Chapter(s): ○ 10			

Task 2: Programming w/ on-the-spot Grading
• Think Python 2e Chapter(s):
  ○ 8
  ○ 10 – specifically look at 10.9
  ○ Research ord() and chr() functions			

Task 3: Programming w/ on-the-spot Grading • Think Python 2e Chapter(s): ○ 14 • https://www.w3schools.com/python/python_file_open.asp			

#7	JavaScript	# of Tasks: 1	1 February 2024
Lab Topics: • Strings • Arrays • File I/O • JSON			
Task 1: Programming w/ on-the-spot Grading • Eloquent JavaScript Chapters: ○ 4 • https://nodejs.dev/en/learn/reading-files-with-nodejs/ • https://www.geeksforgeeks.org/how-to-work-with-node-js-and-json-file/ • https://reactgo.com/javascript-convert-string-to-double/			

#8	Racket	# of Tasks: 3	6 February 2024
Lab Topics: • Strings • Lists • Sets			
All Tasks will be submitted via completion of a Self-Assessment on D2L			

Task 1: Programming w/ Self-Assessment
• The Racket Reference
  ○ 4.4
  ○ 4.6 - (char=?)
• Lists:
  ○ https://learnxinyminutes.com/docs/racket/			

Task 2: Programming w/ Self-Assessment
• The Racket Reference
  ○ 4.2
  ○ 4.6 – char->integer, integer->char			

Task 3: Reflection
• Understand the difference between a list and a set:
  ○ https://learnxinyminutes.com/docs/racket/
  ○ The Racket Reference: 4.10, 4.18			

#9	Octave	# of Tasks: 2	8 February 2024
Lab Topics: • Strings • Characters • Cells Array • File I/O			

Task 1: Programming
• GNU Octave Documentation:
  ○ 5.6
  ○ 8.5.2
  ○ 10.5			

Task 2: Programming w/ Submission on D2L
• GNU Octave Documentation
  ○ 5.3.2
  ○ 6.2.1
  ○ 6.2.3
• https://octave.sourceforge.io/octave/function/char.html
  ○ Cast an integer to a character.			

#10	Midterm Review	# of Tasks: 4	13 February 2024
Lab Topics: • Review for Midterm			
Task 0: Midterm Information			
Task 1: Peer Evaluation			
Task 2: Reflection			
Task 3: Organization and Correction			

#11	Extra	# of Tasks: 1	15 February 2024
Lab Topics: • View Other Students' Exploration Activities.			
Task 1: Explore Others' Exploration Activities			

Midterm – 20 February 2024
(Snow date: Next Opened Lab Period)

Cycle #3: Functional Programming

#12	Python	# of Tasks: 3	22 February 2024
Lab Topics: • Lambda Functions • Mapping and Filtering			
Task 1: Programming (in Partners) • https://realpython.com/python-functional-programming/			
Task 2: Programming w/ on-the-spot Assessment • https://learnpython.com/blog/python-if-in-one-line/			
Task 3: Programming w/ Self-Assessment • https://www.geeksforgeeks.org/python-map-function/			

#13	JavaScript	# of Tasks: 2	27 February 2024
Lab Topics: • Anonymous Functions • Filtering			
Task 1: Programming • https://www.w3schools.com/js/js_strings.asp • https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Functions/Arrow_functions • https://www.geeksforgeeks.org/node-js-split-function/			
Task 2: Programming w/ on-the-spot Grading			

#14	Racket	# of Tasks: 3	29 February 2024
Lab Topics: • Lambda/Anonymous Functions • Mapping and Filtering			
Task 1: Programming in Partners • This entire lab will require you to work with a partner. It is recommended you sit next to your partner when you attend the lab. If you do not have a partner, one will be assigned.			
Task 2: Programming in Partners			

Task 3: Programming in Partners w/ Self-Assessment
• The Racket Reference
  ○ 4.3.2 – abs
• https://learnxinyminutes.com/docs/racket/
  ○ map
  ○ drop			

Reading Week

#15	Octave	# of Tasks: 2	12 March 2024
Lab Topics: • Various Additional Mathematical Functions • Anonymous Functions • Comparison Functions			

Task 1: Describe the Program
• GNU Octave Documentation:
  ○ 4.4.1
  ○ 11.12.2			

Task 2: Programming with on-the-spot Grading
• GNU Octave Documentation
  ○ 10.5
  ○ 17.1			

#16	Extra	# of Tasks: 3	14 March 2024
Lab Topics: • Reflect on Course Content			
Task 1: Self-Reflection			
Task 2: Group Discussions • Will require working with a group of 4. If you do not have a group, you will be assigned one.			
Task 3: Goal Review and Setting and Exam Prep			

Cycle #4: Object Oriented Programming

#17	Python	# of Tasks: 3	19 March 2024
Lab Topics: • Class Creation • Instance Variables • Methods • Inheritance			
Task 1: Planning and Programming (in Group of 3) • https://realpython.com/python3-object-oriented-programming/ • https://www.geeksforgeeks.org/abstract-classes-in-python/ • https://blog.enterprisedna.co/python-how-to-import-a-class/ • https://www.w3schools.com/python/ref_func_round.asp			
Task 2: Programming			
Task 3: Executing and Correcting Code (in Group of 3)			

#18	JavaScript	# of Tasks: 1	21 March 2024
Lab Topics: • Class Creation • Instance Variables • Methods • Aggregation			
Task 1: Edit and Add to Given Code • https://www.freecodecamp.org/news/how-javascript-implements-oop/ ○ Specifically, the class information • Review lists in JavaScript as well as lists that contain other lists. • Review the Data Structure Graphs – specifically with an adjacency list			

#19	Racket	# of Tasks: 2	26 March 2024
Lab Topics: • Class Definition • Object Instantiation • Accessors and Mutators • Methods			

Task 1: Peer Evaluation
• The Racket **Guide**
  ○ 6.6
• The Racket **Reference**
  ○ 6.1 – 6.3 (Basic OOP only – the content of CS1073 without inheritance)			

Task 2: Programming w/ Self-Assessment			

#20	Octave	# of Tasks: 1	28 March 2024
Lab Topics: • Class Definition • Object Instantiation • Accessors and Mutators • Methods			

Task 1: Exploration
• GNU Octave Documentation:
  ○ 34 – Object Oriented Programming
  ○ Specifically, 34.1, 34.2, and 34.5			

#21	Final Exam Review	# of Tasks:	2 April 2024
Lab Topics: •			
Task 1:			

#22	Extra	# of Tasks: 1	4 April 2024
Lab Topics: • View Other Students' Exploration Activities.			
Task 1: Explore Others' Exploration Activities			

8 – 12 April 2024: Portfolio Meetings