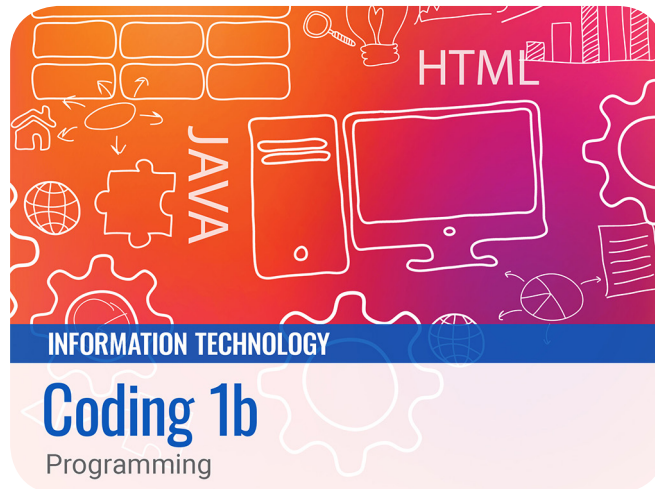


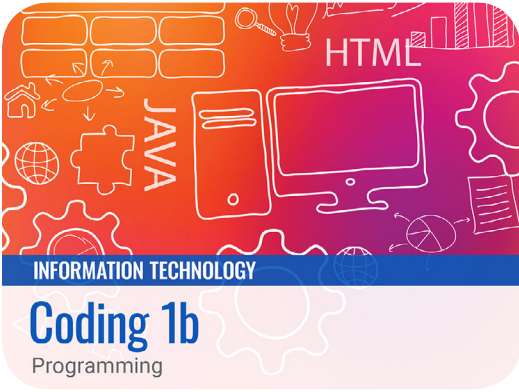


eDynamicLearning

— CAREER & ELECTIVE COURSES —



Course Syllabus



Coding 1b: Programming

Course Description

Cultivate your understanding of programming languages and expand on your knowledge of website development. Learn the difference between web development and web application development as well as further explore Advanced Python, HTML, and JavaScript. You will also examine software engineering concepts, learn more about security, privacy, and ethics in technology, and explore the wide variety of careers in computing.

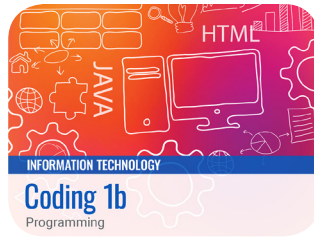
Course Code: EDL105

Required Materials

- Students will need to create a free account for the following sites:
 - <https://www.pythonanywhere.com/>
 - <https://trinket.io/>
- Students will use the following site to create flowcharts:
 - <https://www.draw.io/>
- They can interact with these web sites through any typical web browser.

Table of Contents

Unit 1: Get the IDE(a)?	3
Unit 2: The Software—Human Interface	4
Unit 3: Coding Structures	5
Unit 4: Modular Programming	6
Midterm Exam	7
Unit 5: Data Security	8
Unit 6: Top-Notch Programming	9
Unit 7: Developing Web Solutions: Part 1	10
Unit 8: Developing Web Solutions: Part 2	11
Final Exam	12



Unit 1: Get the IDE(a)?

Unit Summary

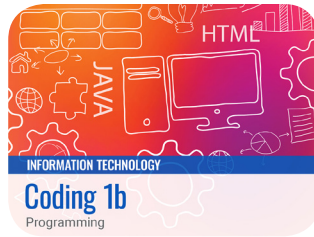
What is the difference between soft- and hardware? That's a pretty simple question isn't it? But do you know how exactly the two play together in order to create the platforms that development and coding take place on? From the basics of hardware and software environments to specific tool-kits needed for development, we will be sure to cover all of this and more. After all, a solid knowledge of the necessary and available tools for development of any kind is essential in order to fully realize your potential as a developer, programmer or other IT expert.

Learning Objectives

- Identify, explain, and compare hardware components
- Understand different software environments and explain what makes them unique
- Briefly describe different sets of development tools
- Accurately explain what dev tool-sets are and can be used for
- Analyze why different tool-kits are used for different purposes

Assignments

Unit 1 Text Questions	Homework	10 points
Unit 1 Online Lab Questions	Homework	10 points
Unit 1 Activity 1	Homework	15 points
Unit 1 Activity 2	Homework	15 points
Unit 1 Discussion Assignment 1	Discussion	5 points
Unit 1 Discussion Assignment 2	Discussion	5 points
Unit 1 Quiz	Quiz	15 points



Unit 2: The Software—Human Interface

Unit Summary

At the end of the day, which is more important—having a great interface for users or having well-built software that gets the job done? It’s a trick question. The two are equally important, but some programmers assume that the interface is more of an afterthought, something to be added when all the coding is done. This could not be further from the truth! In this unit, we will explore in detail why user interfaces are one of the most important pieces of any software or development.

Learning Objectives

- Define, explain, and manipulate different data types
- Effectively prompt for, validate, and constrain input information
- Design simple user interfaces and incorporate graphics into them
- Describe different GUI libraries and toolkits
- Perform simple tasks in PythonAnywhere and Trinket.io

Assignments

Unit 2 Text Questions	Homework	10 points
Unit 2 Online Lab Questions	Homework	10 points
Unit 2 Activity 1	Homework	15 points
Unit 2 Activity 2	Homework	15 points
Unit 2 Discussion Assignment 1	Discussion	5 points
Unit 2 Discussion Assignment 2	Discussion	5 points
Unit 2 Quiz	Quiz	15 points



Unit 3: Coding Structures

Unit Summary

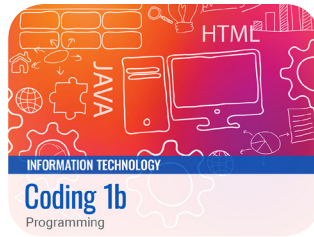
In previous units, you’ve gotten a taste of what you can do with Python. In this unit, you’ll develop your coding skills by learning about some of the most important features of Python and how to use them. You’ll learn how to create a program that can run different parts of the program in different situations. You’ll discover how to make something happen repeatedly—without having to code it over and over again—and you’ll see how you can organize your variables into groups.

Learning Objectives

- Describe, develop, and program selection statements
- Explain, create, and use loops
- Describe internal documentation and effectively use comments
- Describe, create, and use lists
- Understand, create, and use arrays, both single and multidimensional

Assignments

Unit 3 Text Questions	Homework	10 points
Unit 3 Online Lab Questions	Homework	10 points
Unit 3 Activity 1	Homework	15 points
Unit 3 Activity 2	Homework	15 points
Unit 3 Discussion Assignment 1	Discussion	5 points
Unit 3 Discussion Assignment 2	Discussion	5 points
Unit 3 Quiz	Quiz	15 points



Unit 4: Modular Programming

Unit Summary

In the last unit, you got your feet wet with Python programming, and you've learned how to create some basic programs. Now, you will be able to expand your skills by learning how to create and use your own functions. Also, you'll learn how to prevent errors from crashing your programs.

Learning Objectives

- Describe the process for creating functions and create your own functions
- Demonstrate the ability to pass arguments into functions
- Explain the difference between global and local variables and select the appropriate variable to use
- Describe and use recursive functions
- Describe strategies for avoiding errors and apply those strategies to a programming task

Assignments

Unit 4 Text Questions	Homework	10 points
Unit 4 Online Lab Questions	Homework	10 points
Unit 4 Activity	Homework	15 points
Unit 4 Discussion Assignment 1	Discussion	5 points
Unit 4 Discussion Assignment 2	Discussion	5 points
Unit 4 Quiz	Quiz	15 points



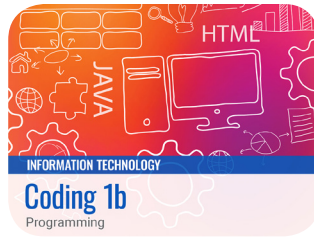
Midterm Exam

Learning Objectives

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from the first four units in this course (Note: You will be able to open this exam only one time.)

Assignments

Midterm Exam	Exam	50 points
Midterm Discussion Assignment	Discussion	5 points



Unit 5: Data Security

Unit Summary

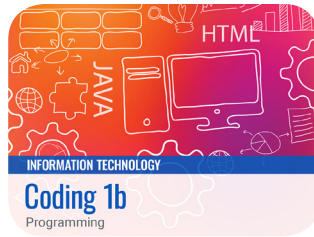
Data security is something of a hot topic across the globe. Everywhere, people are taking steps to secure their information and companies are being forced to think about what to do with data due to privacy protection laws. If you were to go by the news alone, you'd think data security was bad almost everywhere, with banks and major companies reporting data breaches. How does this happen? You may have a rough idea of how companies are breached, but the truth is actually a lot more technical. So, let's take a look at data security, both how it can be exploited, and also how it can be protected.

Learning Objectives

- Explain the principles of cryptography, including encryption, digital signatures, and authentication methods
- Identify computer, network, and software security risks and vulnerabilities
- Design appropriate system of controls and security measures
- Implement a basic security method (encryption, digital signature, or authentication)
- Describe how to recover a machine from systems failure or virus

Assignments

Unit 5 Text Questions	Homework	10 points
Unit 5 Online Lab Questions	Homework	10 points
Unit 5 Activity	Homework	15 points
Unit 5 Discussion Assignment 1	Discussion	5 points
Unit 5 Discussion Assignment 2	Discussion	5 points
Unit 5 Quiz	Quiz	15 points



Unit 6: Top-Notch Programming

Unit Summary

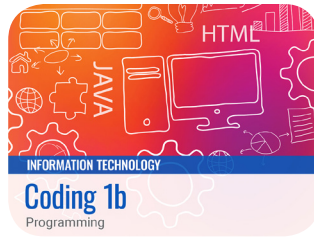
Now that you've learned about lists and loops, you have some powerful Python programming tools that you can use when you write programs. In this unit, we'll build on that knowledge so that you can program more efficiently. You'll also learn about some classic algorithms used in programming. And, you'll discover the most common ways that professional programmers improve their code.

Learning Objectives

- Use Python efficiently to create lists, access functions, and import modules
- Explain and adapt classic algorithms in Python
- Develop algorithms to solve computer programming problems
- Describe and use common peer code review techniques

Assignments

Unit 6 Text Questions	Homework	10 points
Unit 6 Online Lab Questions	Homework	10 points
Unit 6 Activity	Homework	15 points
Unit 6 Discussion Assignment 1	Discussion	5 points
Unit 6 Discussion Assignment 2	Discussion	5 points
Unit 6 Quiz	Quiz	15 points



Unit 7: Developing Web Solutions: Part 1

Unit Summary

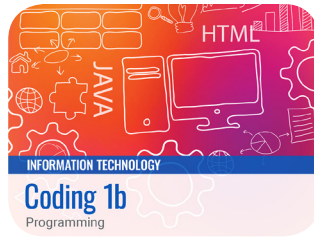
Learning the theories of coding and Python is one thing, but practicing in the context of a complete project is something else entirely. Completing separate tasks and assignments is a great start towards a project, but in order to get to know every part of the development life-cycle of a piece of software, it's necessary to do just that—so get ready to create your own piece of software as part of this project.

Learning Objectives

- Work as part of a structured team in assigned roles
- Create the environment necessary for productive work (i.e., research, flowcharts, etc.)
- Structure dynamic websites and design interfaces and solutions for them
- Build front-end, client-facing websites with a full-stack of HTML, CSS, Python and Django in the cloud

Assignments

Unit 7 Text Questions	Homework	10 points
Unit 7 Online Lab Questions	Homework	10 points
Unit 7 Activity 1	Homework	15 points
Unit 7 Activity 2	Homework	15 points
Unit 7 Discussion Assignment 1	Discussion	5 points
Unit 7 Discussion Assignment 2	Discussion	5 points
Unit 7 Quiz	Quiz	15 points



Unit 8: Developing Web Solutions: Part 2

Unit Summary

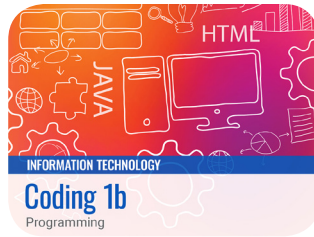
Finishing a project is always more difficult than starting it—the team is running out of motivation and energy. Some of the initial ideas didn't work out and some aspects are running late—that is the reality of being a developer. Being able to see it through to the end, however, is the mark of being a good developer. Seeing that big idea completed and ready for usage is a great feeling—especially after all the hard work you put into it!

Learning Objectives

- Describe the structure of back-end coding
- Test and debug your code
- Launch and use your finished application
- Explain the connection between databases and websites
- Write and execute test scenarios as part of a project

Assignments

Unit 8 Text Questions	Homework	10 points
Unit 8 Online Lab Questions	Homework	10 points
Unit 8 Activity 1	Homework	15 points
Unit 8 Activity 2	Homework	15 points
Unit 8 Discussion Assignment 1	Discussion	5 points
Unit 8 Discussion Assignment 2	Discussion	5 points
Unit 8 Quiz	Quiz	15 points



Final Exam

Learning Objectives

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from units five to eight in this course – the last four units. (Note: You will be able to open this exam only one time.)

Assignments

Final Exam	Exam	50 points
Class Reflection Discussion Assignment	Discussion	10 points