



THE SCHOOL OF PROGRAMMING AND DEVELOPMENT

Intro to Programming

NANODEGREE SYLLABUS



Overview

Introduction to Programming Nanodegree Program

Learn the basics of programming through HTML, CSS and Python. Explore possible programming paths with our final project selection. Get confident in your ability to think and problem-solve like a programmer.



Program Information



ESTIMATED TIME

5 months
Study 10 hours/week



LEVEL

Foundational



PREREQUISITES

Basic computer skills, such as managing files, running programs, and using a web browser to navigate the Internet.

HARDWARE/SOFTWARE REQUIRED

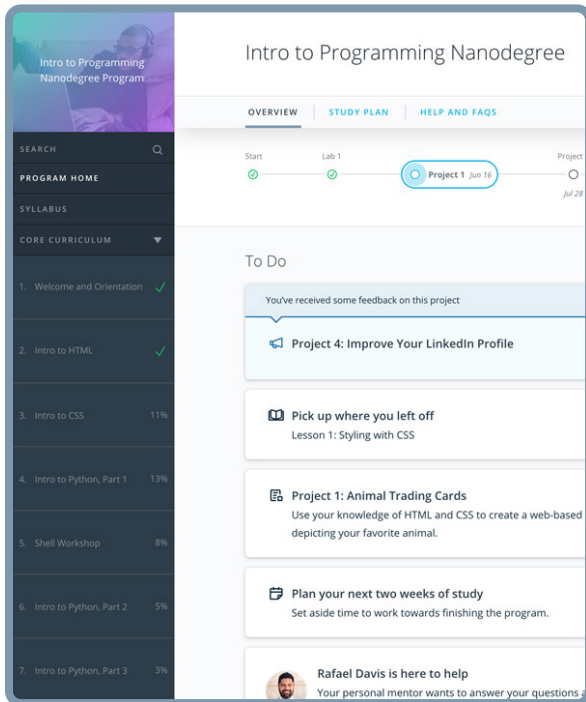
- Python 3
- A code/text editor, such as Vim, Sublime Text, Atom, or VSCode
- A web browser
- A command line interface, such as Terminal (on Mac) or Git Bash (on Windows)



LEARN MORE ABOUT THIS NANODEGREE

Contact us at enterpriseNDs@udacity.com.

Our Classroom Experience



REAL-WORLD PROJECTS

Learners build new skills through industry-relevant projects and receive personalized feedback from our network of 900+ project reviewers. Our simple user interface makes it easy to submit projects as often as needed and receive unlimited feedback.

KNOWLEDGE

Answers to most questions can be found with Knowledge, our proprietary wiki. Learners can search questions asked by others and discover in real-time how to solve challenges.

LEARNER HUB

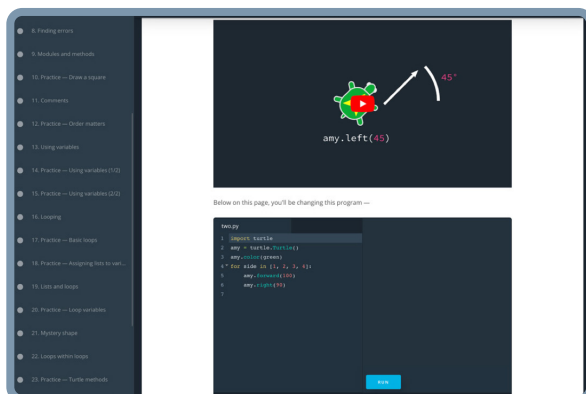
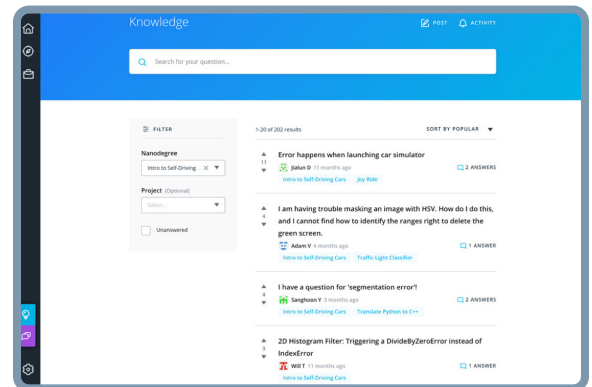
Learners leverage the power of community through a simple, yet powerful chat interface built within the classroom. Learner Hub connects learners with their technical mentor and fellow learners.

WORKSPACES

Learners can check the output and quality of their code by testing it on interactive workspaces that are integrated into the classroom.

QUIZZES

Understanding concepts learned during lessons is made simple with auto-graded quizzes. Learners can easily go back and brush up on concepts at anytime during the course.



CUSTOM STUDY PLANS

Mentors create a custom study plan tailored to learners' needs. This plan keeps track of progress toward learner goals.

PROGRESS TRACKER

Personalized milestone reminders help learners stay on track and focused as they work to complete their Nanodegree program.

Learn with the Best



Karl Krueger

INSTRUCTOR

Karl is a Course Developer at Udacity. Before joining Udacity, Karl was a Site Reliability Engineer (SRE) at Google for eight years, building automation and monitoring to keep the world's busiest web services online.



Kelly Howard

INSTRUCTOR

Kelly is the Product Lead for the Web Development Nanodegree programs at Udacity.



Julia Van Cleve

INSTRUCTOR

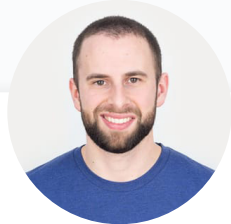
Julia is a Content Developer at Udacity and was previously a middle school math teacher in San Jose, CA. She also dabbled in freelance web development, designing websites for small businesses in the Bay Area.



Abe Feinberg

INSTRUCTOR

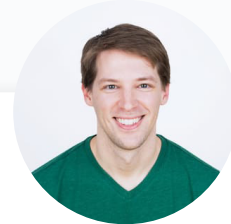
Abe is a science teacher and educational psychologist who loves learning and finding out how things work. He has a particular interest in using AI to optimize education and his ultimate goal is to replace himself with a robot that can teach better than he can.



James Parkes

INSTRUCTOR

James received his degree in Computer Science and Mathematics, then went on to become a Udacity instructor in several programs. His personal mission is clear: to open the doors of opportunity for others by empowering them with excellent educational experiences.



Richard Kalehoff

INSTRUCTOR

Richard is a Course Developer with a passion for teaching. He has a degree in computer science. He first worked for a nonprofit doing everything from front end web development, to backend programming, to database and server management.

Nanodegree Program Overview

Course 1: Intro to HTML

For this section, you will submit your very first programming file containing HTML code. HTML is the coding language for building websites. We recommend taking notes from this section and using your notes as the content for your HTML file. This project is a lab that is auto-graded in the classroom.

LESSON TITLE	LEARNING OUTCOMES
WELCOME TO THE NANODEGREE PROGRAM	<ul style="list-style-type: none">• Understand how to set up for the program on your personal device• Introduction to the “Programmer Mindset”• Successfully write and render your first lines of HTML code with a text editor and browser
NANODEGREE PROGRAM ORIENTATION	<ul style="list-style-type: none">• Understand how to submit projects• Understand student support services that are offered for students• Adopt habits of successful students
THE WORLD WIDE WEB	<ul style="list-style-type: none">• High-level overview on how the web works• Components of the web: browsers, HTTP requests, servers, the internet, etc.
HTML BASICS	<ul style="list-style-type: none">• HTML tags• Adding images• HTML syntax• Whitespace• Inline vs block elements• HTML document structure



Course 2: Intro to CSS

In this section, you'll learn both HTML and CSS — both languages for developing websites. For the project, you'll use HTML and CSS to make animal trading cards. You will apply your knowledge of HTML Document Structure to your HTML file and then create custom CSS styling based on your preferences. This project will demonstrate your understanding of linking CSS files in HTML files, implementing CSS classes to avoid repetition, as well create semantically organized HTML code.

Project

Animal Trading Cards

In this project, you'll be creating a trading card for your favorite animal. You will use your knowledge of HTML to create the structure for your trading card. Then you will use CSS styling to design it.

LESSON TITLE

LEARNING OUTCOMES

ADDING CSS TO HTML

- Understanding CSS basics
- Divs, spans, and classes
- Semantic tags
- Using DevTools in the browser
- Verifying HTML and CSS files
- Debugging HTML and CSS code
- Page structure
- Visual styling
- Designing with boxes

ANIMAL TRADING CARDS

- Apply what you've learned to create your first code-reviewed project

Nanodegree Program Overview

Course 3: Intro to Python

In this section, you will learn the Python programming language. You will finish by building your own interactive game using Python that can be shared with your friends.

Project

Adventure Game

Create an interactive game in Python using modules, loops, conditionals and functions. Building this program will affirm your understanding of Python syntax, give you practice with fundamental programming logic, and demonstrate your ability to solve problems with code.

LESSON TITLE	LEARNING OUTCOMES
TURTLES & PYTHON	<ul style="list-style-type: none">• Write your first lines of Python code using turtles — a visual module that displays colorful rendition of programming
FUNCTIONS — PART 1	<ul style="list-style-type: none">• Learn how to use functions to take an input and transform it into some output• Explore syntax error messages and troubleshoot basic Python code
FUNCTIONS — PART 2	<ul style="list-style-type: none">• Understand the difference between print and return statements• Learn how to manage the flow of a computer program using Boolean values, if statements and while loops
SHELL WORKSHOP	<ul style="list-style-type: none">• Understand and practice working with the Command Line Interface (CLI)
PYTHON AT HOME	<ul style="list-style-type: none">• Installing Python and learning Command Line Interface (CLI) basics• Learn how to store values in variables and work with text as strings• Selecting substrings with string indexing



Course 3: Intro to Python, cont.

LESSON TITLE	LEARNING OUTCOMES
STRINGS & LISTS	<ul style="list-style-type: none">• Learn how to store values in variables and work with text as strings• Selecting substrings with string indexing• Use string methods: slicing, concatenation, find and replace• Use lists to store more complex data• Use for loops to programmatically access each item within a list
VERSION CONTROL WITH GIT	<ul style="list-style-type: none">• Learn about the benefits of version control and install version control
WORKING WITH FILES	<ul style="list-style-type: none">• Understand how files are created and stored in computer memory• Learn how to list files in a directory, work with filenames and move and organize files• Learn how to read text from a text file, process that text using string operations, and write text to another text file.• Work through some common bugs in text processing
OBJECTS & CLASSES	<ul style="list-style-type: none">• Understand the difference between objects and classes in programming• Define a new class, understand the “self” and define special methods like initializers• Create instance variables• Learn about inheritance, super classes and class variables

Nanodegree Program Overview

Course 4: Intro to Javascript

Learn the history of JavaScript and how it compares to Python programming. Understand how the DOM is formed, what nodes and elements are, and how to select items from the DOM. By the end, you'll write JavaScript code that allows the user to create a grid of squares representing their design, and apply colors to those squares to create a digital masterpiece.

Project

Pixel Art Maker

For this project, you'll build a single-page web app that allows users to draw pixel art on a customizable canvas!

LESSON TITLE

LEARNING OUTCOMES

WHAT IS JAVASCRIPT?

- Understand the history of JavaScript and start writing your code immediately using the JavaScript console

DATA TYPES & VARIABLES

- Learn to represent real-world data using JavaScript variables and distinguish between the different data types in the language

CONDITIONALS

- Learn how to add logic to your JavaScript programs using conditional statements

LOOPS

- Harness the power of JavaScript loops to reduce code duplication and automate repetitive tasks



Course 4: Intro to Javascript, cont.

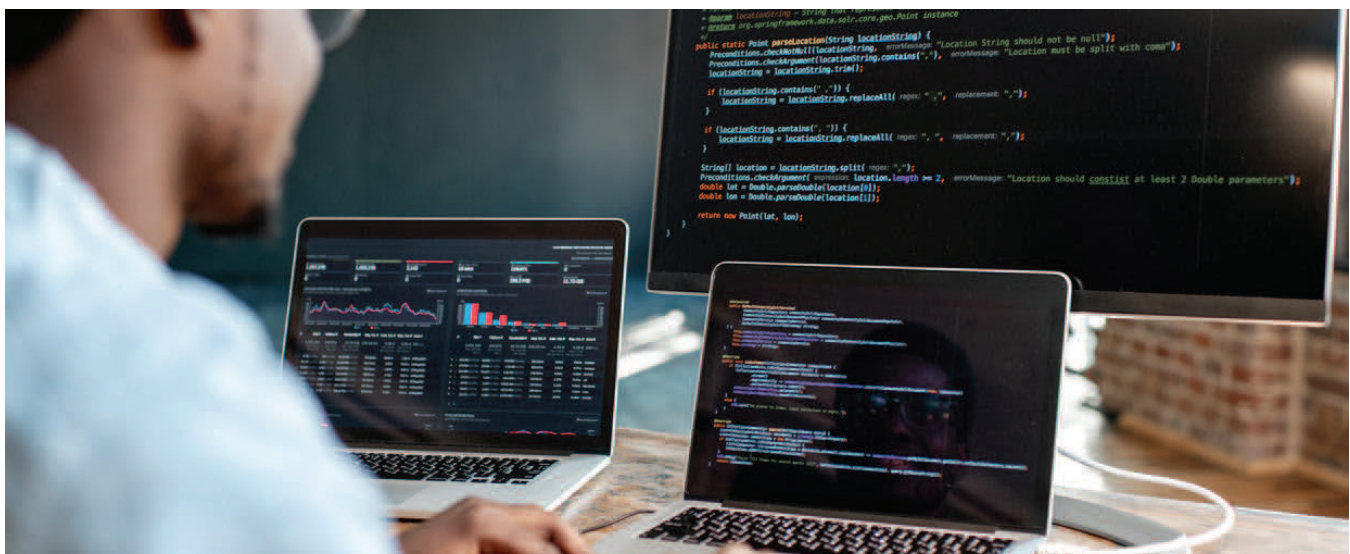
LESSON TITLE	LEARNING OUTCOMES
FUNCTIONS	<ul style="list-style-type: none">• Dive into the world of JavaScript functions. Learn to harness their power to streamline and organize your programs
ARRAYS	<ul style="list-style-type: none">• Learn how to use arrays to store complex data in your JavaScript programs
OBJECTS	<ul style="list-style-type: none">• Meet the next JavaScript data structure: the object. Learn to use it to store complex data alongside arrays
ES6 SYNTAX	<ul style="list-style-type: none">• Learn how to update your code to comply with this major JavaScript update
THE DOCUMENT OBJECT MODEL	<ul style="list-style-type: none">• Understand how the DOM is formed, what nodes and elements are, and how to select items from the DOM
CREATING CONTENT WITH JAVASCRIPT	<ul style="list-style-type: none">• Use JavaScript and DOM methods to create new page content, update existing content and delete content
WORKING WITH BROWSER EVENTS	<ul style="list-style-type: none">• Learn what an event is, how to listen for an event and respond to it, what data is included with an event, and the phases of an event

Nanodegree Program Overview

Extracurricular

In this section, there is no project submission. Instead, you will explore a quick overview of the vast world of programming. After this section, you'll have a better understanding of different options you have as a programmer.

LESSON TITLE	LEARNING OUTCOMES
FRONT-END PROGRAMMING	<ul style="list-style-type: none">Learn about front-end web developers who create intuitive and responsive websites
BACK-END PROGRAMMING	<ul style="list-style-type: none">Learn about back-end web programmers who write server-side code to build web apps that serve millions of people worldwide
MOBILE PROGRAMMING	<ul style="list-style-type: none">Learn about mobile programming and the differences between iOS and Android programming
DATA ANALYSIS PROGRAMMING	<ul style="list-style-type: none">Learn about data analysts who analyze data to direct growth and make informed decisions



Our Nanodegree Programs Include:



Pre-Assessments

Our in-depth workforce assessments identify your team's current level of knowledge in key areas. Results are used to generate custom learning paths designed to equip your workforce with the most applicable skill sets.



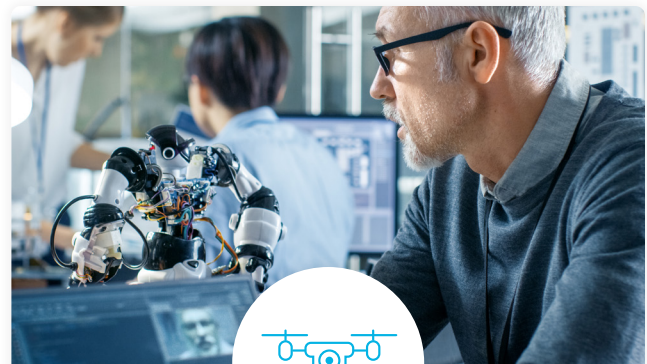
Dashboard & Progress Reports

Our interactive dashboard (enterprise management console) allows administrators to manage employee onboarding, track course progress, perform bulk enrollments and more.



Industry Validation & Reviews

Learners' progress and subject knowledge is tested and validated by industry experts and leaders from our advisory board. These in-depth reviews ensure your teams have achieved competency.



Real World Hands-on Projects


Through a series of rigorous, real-world projects, your employees learn and apply new techniques, analyze results, and produce actionable insights. Project portfolios demonstrate learners' growing proficiency and subject mastery.

Our Review Process

Real-life Reviewers for Real-life Projects

Real-world projects are at the core of our Nanodegree programs because hands-on learning is the best way to master a new skill. Receiving relevant feedback from an industry expert is a critical part of that learning process, and infinitely more useful than that from peers or automated grading systems. Udacity has a network of over 900 experienced project reviewers who provide personalized and timely feedback to help all learners succeed.


All Learners Benefit From:




Line-by-line feedback for coding projects



Industry tips and best practices



Advice on additional resources to research



Unlimited submissions and feedback loops



Vaibhav
UDACITY LEARNER

"I never felt overwhelmed while pursuing the Nanodegree program due to the valuable support of the reviewers, and now I am more confident in converting my ideas to reality."

_____ now at _____
CODING VISIONS INFOTECH


How it Works

Real-world projects are integrated within the classroom experience, making for a seamless review process flow.

- Go through the lessons and work on the projects that follow
- Get help from your technical mentor, if needed
- Submit your project work
- Receive personalized feedback from the reviewer
- If the submission is not satisfactory, resubmit your project
- Continue submitting and receiving feedback from the reviewer until you successfully complete your project

About our Project Reviewers


Our expert project reviewers are evaluated against the highest standards and graded based on learners' progress. Here's how they measure up to ensure your success.



900+

Expert Project Reviewers


Are hand-picked to provide detailed feedback on your project submissions.



1.8M

Projects Reviewed

Our reviewers have extensive experience in guiding learners through their course projects.



3

Hours Average Turnaround

You can resubmit your project on the same day for additional feedback.



4.85 /5

Average Reviewer Rating

Our learners love the quality of the feedback they receive from our experienced reviewers.



Udacity © 2021

2440 W El Camino Real, #101
Mountain View, CA 94040, USA - HQ

For more information visit: www.udacity.com/enterprise