Introduction to Programming

Matthew X. Curinga

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**Computer Science 0145-602, Fall 2016**

**Keywords:** computer programming, CS1, javascript, computational thinking, critical computational literacy

**Description:** This course introduces students to programming and some core concepts of computer science, using a modern, object oriented programming language. Students learn concepts of variables, functions, repetition/loops, basic data structures (arrays, lists, hashtables), and basic object oriented programming.

We are looking at a society increasingly dependent on machines, yet decreasingly capable of making or even using them effectively. ― Douglas Rushkoff, *Program or Be Programmed: Ten Commands for a Digital Age*

**Class meetings:** Tues. 5-7PM, Manhattan Center

**Instructor:** [Matthew X. Curinga](http://matt.curinga.com), [mcuringa@adelphi.edu](mailto:mcuringa@adelphi.edu)

**Office hours:**

* Tuesday 3pm-5pm, Manhattan Center
* Thursday 12-2pm, online
* *office hours by appointment*

# Learning Goals

* understand the types of problems that can be solved using computational techniques
* understand the basic concepts of computation (CPU, RAM, permanent storage, GUIs, file systems, network connections)
* learn core computer programming concepts (abstraction, variables, conditions, functions, repetition, recursion)
* think algorithmically to design and test computer programs
* master the basic syntax and idioms of the Javascript programming language
* use technical documentation, APIs, and the internet to learn new technical concepts
* develop step-by-step problem solving and debugging practices

# Required Books

None

# Required Software/Online Accounts

* Software
  + [Sublime Text 3](http://www.sublimetext.com/3)
  + Git Client [windows](https://git-scm.com/downloads) *for mac insall via xcode*
  + [Slack Client](http://slack.com) (recommend desktop and mobile clients)
  + Firefox or Chrome web browser
* Accounts
  + [Github](https://github.com)
  + [AU Ed Tech Slack channel #code](https://auedtech.slack.com/signup)

# Assignments and Grading

|  |  |  |
| --- | --- | --- |
| Assignment | Pct | Due date |
| Single Page Site | 30% | Sep 13 |
| Slideshow | 30% | Oct 18 |
| Web appplication | 40% | Dec 19 |

## Single Page Website (30%)

Students will build a single-page, informational website on a topic of their choice. Their website will be composed of HTML, CSS, and (optionally) Javascript. It will display their fluency with the HTML elements, styling with CSS, and enhancing user experience with Javascript. The content of the website is entirely up to the student. They are encouraged to create a website on something they are already familiar with and interested in. This is an individual project.

## Photo slideshow (30%)

For this second project students will be asked to re-imagine a common web application–the photo/media slideshow. Students will study existing solutions and then develop and implement their own design. The task will be simplified because this will be a client-side only application. We will not develop components to upload photos, merely to play a set of photos on our website. In this individual project students will work through key programming concepts, including writing their own GUI, custom JS functions, and standard and custom data structures.

## Web appplication (40%)

Using Javascript, HTML, and CSS students will design and develop an interactive web application. For this project, students will go through the full design process. These apps will enable users to store and modify data through a range of interface elements. The code will demonstrate their understanding of core programming and computer science concepts. Unlike the first two projects, this will be a group project.

# Books and online resources

## Documentation & Reference websites

* [World Wide Web Consortium](http://w3.org)
* [Mozilla Developer Network](https://developer.mozilla.org/en-US/)
* [jQuery](http://jquery.com/)
* [W3 Schools](http://www.w3schools.com/)
* [Regular Expressions](http://www.regexr.com/)

## Books

* [HTML and CSS: Design and Build Websites](http://www.wiley.com/WileyCDA/WileyTitle/productCd-1118008189.html), our textbook
* [JavaScript & jQuery: Interactive Front-End Web Development Hardcover](http://www.wiley.com/WileyCDA/WileyTitle/productCd-1118871650.html), also J. Duckett, same series
* [Dive into HTML 5](http://diveintohtml5.info/) [free online]
* [The Elements of Typographic Style Applied to the Web](http://webtypography.net/toc/) [free online]
* [Mastering Regular Expressions](http://shop.oreilly.com/product/9780596528126.do)

## Tutorial websites & online learning

* [Code Academcy](http://www.codecademy.com/)
* [P2PU School of webcraft](https://p2pu.org/en/schools/school-of-webcraft/)
* [Treehouse](http://teamtreehouse.com/) [paid]
* [Thinkful](http://www.thinkful.com/)
* [GeekCamp::HTML5 Tutorial](http://www.geekchamp.com/html5-tutorials/1-html5-overview)
* [SkilledUp::Learn Web Design](http://www.skilledup.com/learn-web-design-guide/)

## Design, accessibility, UX

* [A List Apart](http://alistapart.com/topic/html)
* [Smashing Magazine](http://www.smashingmagazine.com/)
* [Adobe Kuler](https://color.adobe.com/create/color-wheel/)
* [Nielsen/Norman Group](http://www.nngroup.com/articles/)
* [United States Section 508](http://en.wikipedia.org/wiki/Section_508_Amendment_to_the_Rehabilitation_Act_of_1973)
* <https://www.section508.gov/>
* <http://webaim.org/standards/508/checklist>
* [Usability.gov](http://www.usability.gov/index.html)
* [Research-Based Web Design & Usability Guidelines](http://www.usability.gov/guidelines/guidelines_book.pdf)
* [hex/html color chart](http://www.december.com/html/spec/color.html)

## Online Tools

* [w3c HTML Validation Service](http://validator.w3.org/#validate_by_uri+with_options)
* [w3c CSS Validation Service](http://jigsaw.w3.org/css-validator/)
* [Pastebin](http://pastebin.com/)
* [HTML Formatter](http://www.freeformatter.com/html-formatter.html)

## Media Resources

* [Creative Commons Search](http://search.creativecommons.org/), for images, music, etc
* [Wikimedia Commons](http://commons.wikimedia.org/wiki/Main_Page), images and other media (including stuff from Wikipedia), curated
* [Open Clip Art](https://openclipart.org/), free vector graphics
* [Creative Commons Music](http://creativecommons.org/music-communities)
* [Fossil Bank](http://fossilbank.wikidot.com/)
* [Adobe Color](https://color.adobe.com/create/color-wheel/)
* [Colour Lovers Palettes](http://www.colourlovers.com/)
* [DaFonts](http://www.dafont.com/)