

FDM 170A: FUNDAMENTALS OF DIGITAL MEDIA PRODUCTION

University of California, Santa Cruz

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time: second summer session 2020, online

office hours: TBA

working group meeting times: TBA

COURSE CATALOG DESCRIPTION

Introduction to the conceptual and technical fundamentals of making digital media. Covers principles of digital image manipulation, basic web authoring, and interface design through projects that introduce production techniques and methods.

APPROACH

This course takes the approach that digital art is a continuation of the twentieth century practice of conceptual art. In order to compose and analyze what we see and hear – what we experience – in digital media, we need the languages of art and critical theory. In order to craft the inner workings of digital media we need the language of code. The outstanding question of digital media is how can we translate the language of art – issues of editing, montage, and narrative – into the language of code and vice versa? We will pay attention to the art and media histories of video and film and exam how ideas and theories of montage and editing of images, especially moving images, can be written as code. Projects will be created for the web with HTML, CSS, and JavaScript. By the end of the course you will be making simple, interactive videos and have the conceptual and technical tools to embark on making sophisticated, interactive videos.

REQUIREMENTS

There are eight required projects for this course. Seven are defined. For the eighth and final project, we ask that you pick one of the seven earlier projects and produce a second version of that project. The seven defined projects are these:

1. *Re-sequencing:* Gather at least twenty of Eadweard Muybridge's pre-cinematic images and re-sequence and compose them into a story on a webpage.
2. *Collage and Concrete Poetry:* Find a concrete poem that you like and reproduce it with CSS and HTML; or find or write a poem that was not conceived of as a concrete poem and make it into one by reformatting with CSS and HTML.
3. *Montage:* Using some JSON and JavaScript, re-edit some of Sergei Eisenstein's *Battleship Potemkin* (1925).
4. *Instructions for Drawings:* By hand and with code, JavaScript, execute one of Sol LeWitt's wall drawings.

5. *Multi-Screen Interactive*: Using HTML, CSS, and JavaScript create a nine screen interactive composition on a webpage.
6. *{Narrative} Structures*: Write a story grammar in artificial intelligence planning operators expressed as JSON that can generate variants of a set of stories.
7. *Database Cinema*: Assemble and annotate (with JSON) a database of video clips and then repurpose your story grammar so that it is used to automatically generates narrative montages.
8. *Repeat*: Reiterate one of the above seven projects.

For each project there are two graded pieces of work: the completed project and one paragraph of critique that you will write for each of the members in your working group for each of their submitted projects. The class will be divided into working groups of four students each, so you will be responsible for posting a critique in response to the completed projects of three other students eight times over the course of the term.

What is critique? Critique is an essential part of all arts education. Normally, a critique would be held in class with everyone in attendance in order to foster an understanding of how your classmates and your instructor understand the artwork you are creating. I distinguish two kinds of critique. Negative critique is a form of complaint or argument against the artwork or the artist. Positive critique is a form of advocacy, an attempt to try to understand what the artist is trying to do and give helpful suggestions about how to make it better. Personal comments about the artist are out of bounds. Positive critiques must focus on the artwork. For this course, we will focus on performing positive critiques. Positive critiques do not begin with an overall negative evaluation of the work. Even the most rigorous positive critique always begins with a sentence expressing appreciation and understanding for what the artist has achieved or is attempting to achieve with the artwork. Any negative comments, must include suggestions for how to make the work better. A very useful phrase is the following: The artwork could be strengthened in the following ways [continued with a set of constructive suggestions for modifying the artwork].

For each assigned project, the instructors have prepared five items:

- a. Begin by screening the project's video introduction to the art or media history pertinent to the project work, including descriptions and links to important artworks and theories that could provide you with ideas and inspirations for your own work. These introductions are short (10 minutes to 30 minutes) videos. The scripts for the dialogues of the videos is also provided as a PDF so that you can access any URLs mentioned or shown in the videos.
- b. A set of readings for each project will be available on the course website as PDFs. After watching the introductory video, you will need an hour or so to complete the readings. For some assignments, there is also a recommended screening, either a film or websites hosting moving image artworks. Screenings can require up to 2 hours.

- c. For each project, there is an extended description detailing what you will need to do and, when finished, what you will need to upload for review by the instructor and by your working group. These descriptions are in PDF format and hosted on the course website.
- d. A link will be made available to you for a talk-through of the code (HTML, CSS, and/or JavaScript) that you will use or can modify and extend for your project work. A talk-through is an online format for teaching coding originally developed by John Resig for Khan Academy. Each talk-through is displayed in a web browser as a window on the left, that contains the code; a window on the right, that displays the (usually graphical) output of the code; and an audio track set below the code and output windows. By starting the audio track, one can watch the whole thing as if it is just a standard video: the narrator will fill the lefthand window with code and you can see the results in the righthand window. Resig's innovation, however, allows the viewer to interrupt at any moment and change the code in the lefthand window (and, thereby, change the output displayed in the righthand window). The 170A instructors have developed their own version of the software for creating talk-throughs and authored a talk-through specific to each of the projects. Our talk-throughs typically take 15 or 30 minutes to complete.
- e. A critique prompt is also posted for every project as a PDF on the course website. These prompts are there to help you think about how to write your one paragraph critiques for each of the members of your working group.

For each project, you will review these five items, create an artwork in response to the project description, and write three critiques, one for the work of each member of your working group. We estimate that the work for each project will take between 10 and 12 hours.

For those of you who do not already have the knowledge of HTML, CSS, and JavaScript necessary for completion of a project, we recommend you devote additional time to working through a series of Khan Academy talk-throughs to gain that background knowledge. At the end of this document is a detailed schedule that recommends which Khan Academy talk-throughs you should complete before which projects. If you know the material addressed in the Khan Academy talk-throughs, or prefer to learn that material in another way, please feel free to skip the Khan Academy talk-throughs.

SCHEDULING

A detailed schedule for this course can be found on page 9 of this document.

This course is designed to be taken online and asynchronously, although there are some hours during the week when you will need to meet with instructors and other students in the course.

You will be assigned a working group, four students per group. You will be writing short (one paragraph) critiques of each project produced by the other three people in your working group. An instructor will send you an email assigning you to a working group.

Twice a week you will meet with your instructor, your working group, and one other working group; i.e., twice a week you will meet with eight other people. The purpose of these meetings will be to help one another out and to brainstorm ideas. The instructor will find a regular time for these meetings.

In addition, you are not required to, but we recommend that you convene your working group once a week for an hour to discuss the projects on your own, without the instructor.

The instructors will also have regular office hours (on Zoom) where you can meet with them one-on-one or in very small groups. Office hours will be posted during the first week of the course.

The synchronous meetings with the instructors and with the working groups are intended to help you maintain the quick pace necessary to complete this course in the five weeks allowed for it. If you are new to all of the material in this course (both the media art historical references and coding) and you want to get an A, you will probably need to devote 30-40 hours per week to the course [in summer session; half that per week during the academic year when the course runs for 10 weeks instead of 5 weeks]. The Educational Opportunity Programs (EOP) office has a time budgeting account that may be useful: <https://eop.ucsc.edu/advising/Study%20Formula.html> EOP also suggests that you create a schedule for yourself and provides this tool to help plan your schedule: <https://eop.ucsc.edu/advising/advising-timemanagement.html>

Tuesdays and **Thursdays** will be the days of the week when projects are due. You must finish your projects before midnight Pacific Time (i.e., California time). I mention the time zone assuming that some students will not be in California and may be taking the course from a different time zone.

Submission of your projects: You will submit your projects by uploading them to your UCSC UNIX account. They should be accessible to the instructors and your working group members at this URL: <http://people.ucsc.edu/~name/FDM170A/> [where "name" is to be replaced with your UCSC user id].

You will be penalized for late submissions of your projects primarily because you need to make them available for the members of your working group to critique.

Wednesdays and **Fridays** will be the days of the week when your critiques are due. You will not be penalized for posting your critiques late if one or more of your working group members has submitted their project late. Critiques are only late

24 hours after a project has been posted. You will not be penalized for not posting a critique of a project that one of your working group members does not hand in.

Submission of your critiques: You will email the instructor and all of your working group members the text of your critiques. You will also upload the text of your critiques to the Canvas website.

GRADING

Projects: $8 \times 9.5 = 76$

Critiques: $24 \times 1 = 24$

100

A project submitted late, will have one point (aka 1% of the final course grade) deducted for every day or part of a day it is late.

Grade Scale

A+ 100% to 99.99%

A < 99.99% to 95%

A- < 95% to 90%

B+ < 90% to 87%

B < 87% to 83%

B- < 83% to 80%

C+ < 80% to 77%

C < 77% to 73%

C- < 73% to 70%

D+ < 70% to 67%

D < 67% to 63%

D- < 63% to 60%

F < 60% to 0%

DRC REMOTE ACCOMMODATIONS

The Disability Resources Center reduces barriers to inclusion and full participation for students with disabilities by providing support to individually determine reasonable academic accommodations. Operations continue via remote appointments. If you have questions or concerns about exam accommodations or any other disability-related matter, email the DRC Schedulers at drc@ucsc.edu for an appointment.

SMALL GROUP TUTORING

Small Group Tutoring (SGT) supports students academically to advance educational equity by designing inclusive learning environments outside of the classroom. In SGT, you can expect the Tutor to facilitate cooperative group activities designed to have students work together on the course content and

develop study skills for the course. SGT is offered at least three times each week for the entire quarter. The Tutor is an undergraduate student who took the class, did well, and is trained to facilitate group sessions to focus on students' needs to succeed in the course. SGT is open to all students enrolled in the class and they must sign up on our online system: TutorTrac. When students sign up for SGT, they are committing to attend every week. For Summer 2020, students can begin signing up for tutoring on **Monday, June 22rd** and tutoring will begin **Wednesday, June 24th**. Students only have to sign up once for tutoring and their appointments will repeat weekly. Sign-ups will close on **Friday, August 14th** for all Summer Session Sign-Ups. This means that after **August 14th**, no new students can sign up for tutoring.

Want SGT to be successful for you? Bring your books, lecture notes, questions, and be open to working collaboratively with your peers. You can sign up using this link: <https://ucsc.go-redrock.com/tracweb40/NoAccess.4sp?errText=insufficient%20credentials%20to%20view%20content>

You can also find the link on our website: <https://lss.ucsc.edu/index.html>

DISTRIBUTION OF COURSE NOTES

Please note that selling, preparing, or distributing for any commercial purpose course lecture notes or video or audio recordings of any course is explicitly forbidden by campus policy, unless authorized by the University in advance – for instance, by the Disability Resource Center, which can assign students who need one a note taker with a laptop or other recording device – and explicitly permitted by the course instructor in writing. (DRC note taking accommodations should, and usually will, be announced to the instructor in advance in formal communication from the DRC.)

DIFFICULT MATERIAL STATEMENT

In Film + Digital Media courses you will often be assigned films or other material that could contain difficult ideas, uncomfortable language, or graphic depictions of sex or violence. You will be asked to treat these portrayals critically, to consider what is being expressed by the maker, or to examine the potential social impact, and to evaluate the works in a given context. Instructors are happy to speak with you and might direct you to CAPS (Counseling and Psychological Services) at 831-459-2628 or the Disability Resource Center (drc@ucsc.edu or 831-459-2089) should you need additional support in order to do your best work.

UCSC PRINCIPLES OF COMMUNITY

In this class, we abide by the UCSC Principles of Community, so please familiarize yourself with these important principles: <https://www.ucsc.edu/about/principles-community.html>

ACADEMIC DISHONESTY

Academic integrity is the cornerstone of a university education. Academic dishonesty diminishes the university as an institution and all members of the university community. It tarnishes the value of a UCSC degree. All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty in order to ensure that the integrity of scholarship is valued and preserved at UCSC.

In the event a student is found in violation of the UCSC Academic Integrity policy, he or she may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed either by the provost of his or her college or the Academic Tribunal convened to hear the case. Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript.

For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the Academic Integrity page (<https://ue.ucsc.edu/academic-misconduct.html>) at the Division of Undergraduate Education.

INCLUSIVITY STATEMENT

As an instructor at UC Santa Cruz, I value equality of opportunity, human dignity, and racial/ethnic/cultural diversity. Be assured that I will promote a safe and conducive environment for learning. In accordance with University policy, I will not tolerate discrimination or harassment on the basis of race, color, religion, national origin, ancestry, sex, age, marital status, familial status, sexual or gender orientation, disability, or status as a disabled veteran or a veteran of the Vietnam era. In addition to the University's policy, and within the bounds of the course, I do not discriminate on the basis of political or religious beliefs, and I also make every effort to avoid discrimination on the basis of class or income. This means that you do not have to agree with me or the assigned readings in order to do well in this course. You are, however, obligated to demonstrate an understanding of the course material. If there is something I can do to make the class more hospitable, please let me know.

TITLE IX

The university cherishes the free and open exchange of ideas and enlargement of knowledge. To maintain this freedom and openness requires objectivity, mutual trust, and confidence; it requires the absence of coercion, intimidation, or exploitation. The principal responsibility for maintaining these conditions must

rest upon those members of the university community who exercise most authority and leadership: faculty, managers, and supervisors.

The university has therefore instituted a number of measures designed to protect its community from sex discrimination, sexual harassment, sexual violence, and other related prohibited conduct. Information about the Title IX Office (<https://titleix.ucsc.edu/>) the online reporting link (https://ucsc-gme-advocate.symplicity.com/public_report/index.php/pid061098?), applicable campus resources, reporting responsibilities, the UC Policy on Sexual Violence and Sexual Harassment (<https://policy.ucop.edu/doc/4000385/SVSH>), and the UC Santa Cruz Procedures for Reporting and Responding to Reports of Sexual Violence and Sexual Harassment can be found at titleix.ucsc.edu.

The Title IX Office is actively responding to reports and requests for consultation. If you are not currently working with someone in the office and want to make a report/request a consult, you can expect the fastest response by using our online reporting link: https://ucsc-gme-advocate.symplicity.com/public_report/index.php/pid970363?

For more information please visit the Title IX Operations under Covid-19 page: <https://titleix.ucsc.edu/about/titleix-covid19.html>

LAND ACKNOWLEDGEMENT

The land on which USC is built is the unceded territory of the Awaswas-speaking Uypi Tribe. The Amah Mutsun Tribal Band, comprised of the descendants of indigenous people taken to missions Santa Cruz and San Juan Bautista during Spanish colonization of the Central Coast, is today working hard to restore traditional stewardship practices on these lands and heal from historical trauma.

IMPORTANT SUMMER SESSION REMOTE 2020 DEADLINES

Session 2:

Drop: Monday, August 3

Request for "W": Friday, August 14

Summer is unique. **You will not be dropped for non-attendance or non-payment.** You must drop yourself. Dropping before the deadline results in a full-tuition reversal/refund. Withdraw posts a W for the grade and full tuition is charged (no refund).

For all dates and deadlines, including 'change of grade option' (P/NP) and grades due, here is the summer academic calendar: <https://summer.ucsc.edu/studentlife/index.html>

For questions about dropping, requesting a W grade for a course, or withdrawing from the summer quarter, email summer@ucsc.edu.

SCHEDULE

Every week you will have 2 one-hour meeting with the instructor and your working group; also, preferable, once a week your working group will convene for an hour without the instructor. Most weeks you will have a project due on **Tuesday** (before midnight) and a second project due on **Thursday**. Critiques of your classmates project work will be due on **Wednesdays** and **Fridays**.

During the first week of the term, you will need to do a number of things. A detailed email will be sent to you before the start of the term.

Pamela Fox, Chief Content Creator for Computer Science at Khan Academy (<https://www.linkedin.com/in/pamela-fox-5668b1b4/>) has created about 40 hours of talk-throughs to introduce the basics of HTML, CSS, and JavaScript. You may not know any of these basics, in which case it is our recommendation that you work through all of these talk-throughs — although none of the Khan Academy materials are required for this course, and none of your work on Khan Academy will be a part of your grade for this course. These talk-throughs at Khan Academy are simply a very good resource for quickly learning HTML, CSS, and JavaScript. Keeping this in mind, the following detailed schedule labels the eight projects with due dates and places them within the sequence of Khan Academy talk-throughs with the assumption that the material covered in those talk-throughs (and a few other referenced sites of tutorials) will be familiar to you before you start the course projects. Each talk-through takes about five minutes to complete.

1. Khan Academy: Intro to HTML: <https://www.khanacademy.org/computing/computer-programming/html-css/intro-to-html/v/making-webpages-intro>
 - 1.1.Welcome to the web!
 - 1.2.HTML basics
 - 1.3.Quick tip: HTML tags
 - 1.4.Challenge: Write a Poem
 - 1.5.HTML: Text emphasis
 - 1.6.Challenge: You can learn text tags
 - 1.7.HTML: Lists
 - 1.8.Challenge: Your learning list
 - 1.9.HTML: Images
 - 1.9.1.Challenge: A picture-perfect trip
2. Khan Academy: Intro to CSS: <https://www.khanacademy.org/computing/computer-programming/html-css/intro-to-css/pt/css-basics>
 - 2.1.CSS Basics
 - 2.2.Quick tip: Selecting by tag name
 - 2.3.Challenge: Colorful creature
 - 2.4.CSS: Selecting by id
 - 2.5.Challenge: Seasonal ids
 - 2.6.CSS: Selecting by class
 - 2.7.Challenge: Apples and bananas classes

- 2.8.Using simple CSS selectors
- 2.9.Project: Travel webpage
- 3. Khan Academy: More HTML tags: <https://www.khanacademy.org/computing/computer-programming/html-css/html-tags-continued/pt/html-links>
 - 3.1.HTML links
 - 3.2.Challenge: Links you love
 - 3.3.HTML internal links
 - 3.4.Challenge: Jump around
 - 3.5.HTML tables
 - 3.6.Challenge: The dinner table
 - 3.7.HTML comments
 - 3.8.Project: Recipe book
- 4. **Project 1: Re-sequencing** due before midnight, Thursday, July 30
- 5. **Critiques for Project 1** due before midnight, Friday, July 31
- 6. Khan Academy: CSS text properties: <https://www.khanacademy.org/computing/computer-programming/html-css/css-text-properties/v/css-zen-garden>
 - 6.1.CSS Zen Garden
 - 6.2.CSS font-family property
 - 6.3.Challenge: Fancy font families
 - 6.4.CSS font-size property
 - 6.5.Challenge: Great big font sizes
 - 6.6.CSS font styles and shorthand
 - 6.7.Challenge: Famous font formats
 - 6.8.More CSS text properties
 - 6.9.Using CSS text properties
 - 6.10.CSS inheritance
 - 6.11.Project: Blog
- 7. Khan Academy: Web development tools: <https://www.khanacademy.org/computing/computer-programming/html-css/web-development-tools/a/using-the-browser-developer-tools>
 - 7.1.Using the browser developer tools
 - 7.2.Developing webpages outside of Khan Academy
 - 7.3.Hosting your website on a server
 - 7.4.Hosting your website on Github
- 8. Khan Academy: CSS layout: <https://www.khanacademy.org/computing/computer-programming/html-css/css-layout-properties/pt/css-grouping-elements>
 - 8.1.CSS grouping elements
 - 8.2.Challenge: Group the groupers
 - 8.3.CSS width, height, and overflow
 - 8.4.Challenge: The overflowing ocean
 - 8.5.CSS box model
 - 8.6.Challenge: The boxer model
 - 8.7.CSS position
 - 8.8.Challenge: Position planet
 - 8.9.CSS in the wild: Google Maps

- 8.10.CSS floating elements
- 8.11.Challenge: Floating clouds
- 8.12.Using CSS layout properties
- 8.13.Planning your webpage
- 8.14.Project: Event invite
- 9. W3Schools: CSS transform Property: https://www.w3schools.com/cssref/css3_pr_transform.asp
- 10. **Project 2: Collage and Concrete Poetry** due before midnight, Tuesday, August 4
- 11. **Critiques for Project 2** due before midnight, Wednesday, August 5
- 12. Khan Academy: More CSS selectors: <https://www.khanacademy.org/computing/computer-programming/html-css/more-css-selectors/pt/using-multiple-css-classes>
 - 12.1.Using multiple CSS classes
 - 12.2.Challenge: A classy gallery
 - 12.3.Combining CSS class and element selectors
 - 12.4.Challenge: Classes of elements
 - 12.5.CSS descendant selectors
 - 12.6.Challenge: Descendants of Khan
 - 12.7.Grouping CSS selectors
 - 12.8.CSS dynamic pseudo-classes
 - 12.9.Challenge: Grouped animals
 - 12.10.CSS specificity
 - 12.11.CSS specificity rules
- 13. Khan Academy: Other ways to embed CSS: <https://www.khanacademy.org/computing/computer-programming/html-css/more-ways-to-embed-css/pt/using-inline-css-styles>
 - 13.1.Using inline CSS styles
 - 13.2.Using external stylesheets
- 14. CSS3
 - 14.1.CSS3 selectors: https://www.teaching-materials.org/_deprecated/css3-selectors/
 - 14.2. CSS3 properties: <https://www.teaching-materials.org/css3-fx/>
- 15. Khan Academy: Further Learning: <https://www.khanacademy.org/computing/computer-programming/html-css/html-css-further-learning/a/webpage-design>
 - 1. Webpage design
 - 2. HTML validation
 - 3. Validating HTML
 - 4. What to learn next
- 16. The <video> tag
 - 1. W3Schools: https://www.w3schools.com/tags/tag_video.asp
 - 2. W3: <https://www.w3.org/2010/05/video/mediaevents.html>
- 17. **Project 3: Montage** due before midnight, Thursday, August 6
- 18. **Critiques for Project 3** due before midnight, Friday, August 7
- 19. Khan Academy: Intro to programming: <https://www.khanacademy.org/computing/computer-programming/programming/intro-to-programming/v/programming-intro>

- 19.1.What is Programming?
- 19.2.Learning programming on Khan Academy
- 20. Khan Academy: Drawing basics: <https://www.khanacademy.org/computing/computer-programming/programming>
 - 20.1.Making drawings with code
 - 20.2.Quick tip: number scrubbing
 - 20.3.Challenge: Simple snowman
 - 20.4.Drawing more shapes with code
 - 20.5.Challenge: Waving snowman
- 21. Khan Academy: Coloring: <https://www.khanacademy.org/computing/computer-programming/programming/coloring/pt/coloring-with-code>
 - 21.1.Coloring with code
 - 21.2.Quick tip: color picking
 - 21.3.Challenge: Sunny snowy day
 - 21.4.The Power of the Docs
 - 21.5.Project: What's for dinner
- 22. Khan Academy: Variables: <https://www.khanacademy.org/computing/computer-programming/programming/variables/pt/intro-to-variables>
 - 22.1.Intro to Variables
 - 22.2.Using variables
 - 22.3.Challenge: Bucktooth Bunny
 - 22.4.More on Variables
 - 22.5.Challenge: Funky Frog
 - 22.6.Review: Variables
- 23. Khan Academy: Animation basics: <https://www.khanacademy.org/computing/computer-programming/programming/animation-basics/a/what-are-animations>
 - 23.1.What are animations?
 - 23.2.Making animations
 - 23.3.Challenge: Exploding Sun
 - 23.4.Incrementing shortcuts
 - 23.5.A shorter shortcut
 - 23.6.Challenge: Parting Clouds
 - 23.7.Project: Shooting star
- 24. HTML <canvas> tag tutorial: https://www.w3schools.com/graphics/canvas_intro.asp
- 25. Khan Academy: Interactive programs: <https://www.khanacademy.org/computing/computer-programming/programming/interactive-programs/pt/mouse-interaction>
 - 25.1.Mouse Interaction
 - 25.2.Challenge: Tasty Tomato
 - 25.3.Challenge: Mouse movement mania
- 26. Khan Academy: Becoming a community coder: <https://www.khanacademy.org/computing/computer-programming/programming/becoming-a-community-coder/a/evaluate-peer-projects>
 - 26.1.Evaluate peer projects
 - 26.2.Ask for help

27. Khan Academy: Bonus: Resizing with variables: <https://www.khanacademy.org/computing/computer-programming/programming/resizing-with-variables/a/using-math-expressions-in-js>
 - 27.1.Using math expressions in JS
 - 27.2.Resizing shapes with variable expressions
 - 27.3.Using variable expressions
 - 27.4.Challenge: Brown bear eyes
 - 27.5.Project: Animal attack
28. Khan Academy: Text and strings: <https://www.khanacademy.org/computing/computer-programming/programming/text-basics/pt/terrific-text-part-one>
 - 28.1.TerrificText: Part One
 - 28.2.Challenge: My Favorite Foods
 - 28.3.TerrificText: Part Two
 - 28.4.Challenge: Mouse Tracker
 - 28.5.Review: text and strings
 - 28.6.Project: Ad design
29. Khan Academy: Functions: <https://www.khanacademy.org/computing/computer-programming/programming/functions/pt/functions>
 - 29.1.Challenge: Say Your Name
 - 29.2.Function Parameters
 - 29.3.Challenge: Moles in Holes
 - 29.4.Function Return Values
 - 29.5.Challenge: Calculator
 - 29.6.Local and Global Variables
 - 29.7.Special ProcessingJS functions
 - 29.8.Review: Functions
 - 29.9.Project: Fish tank
30. Khan Academy: Logic and if Statements: <https://www.khanacademy.org/computing/computer-programming/programming/logic-if-statements/pt/if-statements>
 - 30.1.If Statements
 - 30.2.Challenge: Bouncy Ball
 - 30.3.More Mouse Interaction
 - 30.4.Challenge: Your First Painting App
 - 30.5.Booleans
 - 30.6.Challenge: Number Analyzer
 - 30.7.Logical Operators
 - 30.8.Challenge: Your First Button
 - 30.9.Challenge: Smarter Button
 - 30.10.If/Else - Part 1
 - 30.11.Challenge: Flashy Flash Card
 - 30.12.If/Else - Part 2
 - 30.13.Review: Logic and if Statements
 - 30.14.Random numbers
 - 30.15.Project: Magic 8-Ball

31. Khan Academy: Debugging programs: <https://www.khanacademy.org/computing/computer-programming/programming/debugging-programs/pt/debugging-with-printlns>
 - 31.1. Debugging with `println()`s
 - 31.2. More debugging tips
32. Khan Academy: Looping: <https://www.khanacademy.org/computing/computer-programming/programming/looping/pt/intro-to-while-loops>
 - 32.1. Intro to While Loops
 - 32.2. Using while loops
 - 32.3. Challenge: A Loopy Ruler
 - 32.4. More While Loops: Balloon Hopper
 - 32.5. Challenge: A Loopy Landscape
 - 32.6. For Loops! A New Kind of Loop
 - 32.7. Challenge: Lined Paper
 - 32.8. Nested For Loops
 - 32.9. Review: Looping
 - 32.10. Project: Build-a-House
33. Khan Academy: Writing clean code: <https://www.khanacademy.org/computing/computer-programming/programming/writing-clean-code/pt/readable-code>
 - 33.1. Readable Code
 - 33.2. Clarifying with Comments
 - 33.3. Writing clean code
34. Khan Academy: Arrays: <https://www.khanacademy.org/computing/computer-programming/programming/arrays/pt/intro-to-arrays>
 - 34.1. Intro to Arrays
 - 34.2. Challenge: Favorite Fruits
 - 34.3. Looping through Arrays
 - 34.4. Challenge: Favorite Animals
 - 34.5. Modifying Arrays
 - 34.6. Challenge: Constellation Maker
 - 34.7. Review: Arrays
 - 34.8. Project: Make it rain
35. Khan Academy: Objects: <https://www.khanacademy.org/computing/computer-programming/programming/objects/pt/intro-to-objects>
 - 35.1. Intro to Objects
 - 35.2. Challenge: Recipe Card
 - 35.3. Modifying Objects
 - 35.4. Challenge: Picture Painter
 - 35.5. Arrays of Objects
 - 35.6. Challenge: Movie Reviews
 - 35.7. Review: Objects
 - 35.8. Project: Bookshelf
36. Khan Academy: Object-Oriented Design: <https://www.khanacademy.org/computing/computer-programming/programming/object-oriented/pt/object-types>
 - 36.1. Object Types

- 36.2.Challenge: Double Rainbow
- 36.3.Object Methods
- 36.4.Challenge: SmileyFace
- 36.5.Object Inheritance
- 36.6.Challenge: Flower Grower
- 36.7.Review: Object-Oriented Design
- 37. Khan Academy: Becoming a better programmer: <https://www.khanacademy.org/computing/computer-programming/programming/good-practices/a/planning-a-programming-project>
 - 37.1.Planning a programming project
 - 37.2.Planning with pseudo-code
 - 37.3.What to learn next
 - 37.4.Help others learn!
- 38. **Project 4: Instructions for Drawings** due before midnight, Tuesday, August 11
- 39. **Critiques for Project 4** due before midnight, Wednesday, August 12
- 40. Khan Academy: Get ready to make your webpages interactive
 - 40.1.Welcome to making webpages interactive
 - 40.2.Review HTML/CSS
 - 40.3.HTML/CSS recap
 - 40.4.Review JavaScript
 - 40.5.JavaScript recap
- 41. Khan Academy: JS and the DOM: <https://www.khanacademy.org/computing/computer-programming/html-css-js/js-and-the-dom/pt/putting-js-in-a-webpage>
 - 41.1.Putting JS in a webpage
 - 41.2.Challenge: A scripted script tag
 - 41.3.The DOM (Document Object Model)
 - 41.4.Understanding the DOM
 - 41.5.Debugging webpages with the browser console
- 42. Khan Academy: DOM access methods: <https://www.khanacademy.org/computing/computer-programming/html-css-js/html-js-dom-access/pt/finding-elements-by-id>
 - 42.1.Finding elements by ID
 - 42.2.Challenge: ID changer
 - 42.3.Finding multiple DOM elements by tag or class name
 - 42.4.Challenge: Custom name tags
 - 42.5.Finding elements by CSS selector
 - 42.6.Challenge: Query modernizer
 - 42.7.Summary: DOM access methods
- 43. Khan Academy: DOM modification: <https://www.khanacademy.org/computing/computer-programming/html-css-js/html-js-dom-modification/pt/changing-attributes>
 - 43.1.Changing attributes
 - 43.2.Challenge: Avatar attributes
 - 43.3.Changing styles
 - 43.4.Challenge: Style guide
 - 43.5.Changing CSS classes

- 43.6.Challenge: Classification
- 43.7.Setting innerHTML and textContent
- 43.8.Challenge: The inside story
- 43.9.Creating elements from scratch
- 43.10.Challenge: Create a solar system
- 43.11.Summary: DOM modification techniques
- 44. Khan Academy: DOM events: <https://www.khanacademy.org/computing/computer-programming/html-css-js/html-js-dom-events/v/making-webpages-interactive-with-events>
 - 44.1.Making webpages interactive with events
 - 44.2.Adding an event listener
 - 44.3.Challenge: Cat Clicker
 - 44.4.DOM event types
 - 44.5.Using the event properties
 - 44.6.Challenge: Cat-stache
 - 44.7.Processing forms with events
 - 44.8.Challenge: Mad Libs
 - 44.9.Preventing default behavior of events
 - 44.10.Summary: DOM events
- 45. **Project 5: Multi-Screen Interactive** due before midnight on Thursday, August 13
- 46. **Critiques for Project 5** due before midnight, Friday, August 14
- 47. Khan Academy: Using JS libraries in your webpage: <https://www.khanacademy.org/computing/computer-programming/html-css-js/using-js-libraries-in-your-webpage/a/whats-a-js-library>
 - 47.1.What's a JS library?
 - 47.2.Using a JS library: Slideshow library
 - 47.3.Where are JS libraries hosted?
 - 47.4.Using JS libraries
 - 47.5.The world of JS libraries
 - 47.6.Which JS library should you use?
- 48. Khan Academy: Further learning: <https://www.khanacademy.org/computing/computer-programming/html-css-js/html-css-js-further-learning/a/html-css-js-further-learning-what-to-learn-next>
 - 48.1.What to learn next
- 49. **Project 6: {Narrative} Structures** due before midnight on Tuesday, August 18
- 50. **Critiques for Project 6** due before midnight, Wednesday, August 19
- 51. **Project 7: Database Cinema** due before midnight on Tuesday, August 25
- 52. **Critiques for Project 7** due before midnight, Wednesday, August 26
- 53. **Project 8: Repeat** [2nd draft of one of the previous] due before midnight on Thursday, August 27th
- 54. **Critiques for Project 8** due before midnight, Friday, August 28 (**end of term**)