**CODE 1**

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| **PUDT 2110 A, CRN 3653**  **6 E. 16th St., Room 602**  **Wednesdays 12:10-2:50 PM, Fall 2016** | **Courtney Snavely**  [**snavc270@newschool.edu**](mailto:snavc270@newschool.edu)  **Office hours by appointment** |

This course is an introduction to programming, the historical and cultural context of software in art and design, and the applications of “creative code” in a studio environment. Students will learn the fundamentals of all software development using the open source framework Processing, writing programs that generate visuals, handle data, and facilitate interactive experiences.

**Learning Outcomes:**

At the completion of this course, students should be able to:

* Demonstrate knowledge and application of fundamental programming concepts using Processing.
* Develop several working interactive/experiential projects using code as a medium for expression.
* Be able to discuss code and its applications critically in a broader cultural context.

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| **Recommended Readings:** |  |
| [FORM+CODE](https://getit.library.nyu.edu/resolve?umlaut.institution=NS&ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&ctx_tim=2017-08-27T13%3A00%3A20IST&url_ver=Z39.88-2004&url_ctx_fmt=infofi/fmt:kev:mtx:ctx&rfr_id=info:sid/primo.exlibrisgroup.com:primo-dedupmrg374676118&rft_val_fmt=info:ofi/fmt:kev:mtx:book&rft.genre=book&rft.jtitle=&rft.btitle=Form+code%20in%20design,%20art,%20and%20architecture&rft.aulast=Reas&rft.aufirst=Casey.&rft.auinit=&rft.auinit1=&rft.auinitm=&rft.ausuffix=&rft.au=Reas,%20Casey&rft.aucorp=&rft.volume=&rft.issue=&rft.part=&rft.quarter=&rft.ssn=&rft.spage=&rft.epage=&rft.pages=&rft.artnum=&rft.pub=Princeton%20Architectural%20Press&rft.place=New%20York&rft.issn=&rft.eissn=9781568989372&rft.isbn=9781568989372&rft.sici=&rft.coden=&rft_id=info:doi/&rft.object_id=&rft.primo=dedupmrg374676118&rft.eisbn=&rft_dat=%3Cnyu_aleph%3E003949429%3C/nyu_aleph%3E%3Cgrp_id%3E433522965%3C/grp_id%3E%3Coa%3E%3C/oa%3E%3Curl%3E%3C/url%3E&rft_id=info:oai/&req.language=eng), Casey Reas | [Processing : a programming handbook for visual designers and artists](https://getit.library.nyu.edu/resolve?umlaut.institution=NS&ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&ctx_tim=2017-08-27T12%3A57%3A19IST&url_ver=Z39.88-2004&url_ctx_fmt=infofi/fmt:kev:mtx:ctx&rfr_id=info:sid/primo.exlibrisgroup.com:primo-dedupmrg373365270&rft_val_fmt=info:ofi/fmt:kev:mtx:book&rft.genre=book&rft.jtitle=&rft.btitle=Processing%20:%20a%20programming%20handbook%20for%20visual%20designers%20and%20artists&rft.aulast=Reas&rft.aufirst=Casey,&rft.auinit=&rft.auinit1=&rft.auinitm=&rft.ausuffix=&rft.au=Reas,%20Casey,%20author&rft.aucorp=&rft.volume=&rft.issue=&rft.part=&rft.quarter=&rft.ssn=&rft.spage=&rft.epage=&rft.pages=&rft.artnum=&rft.pub=&rft.place=&rft.issn=&rft.eissn=9780262028288%20026202828X&rft.isbn=0262321858&rft.sici=&rft.coden=&rft_id=info:doi/&rft.object_id=&rft.primo=dedupmrg373365270&rft.eisbn=&rft_dat=%3Cnyu_aleph%3E005079431%3C/nyu_aleph%3E%3Cgrp_id%3E431153362%3C/grp_id%3E%3Coa%3E%3C/oa%3E%3Curl%3E%3C/url%3E&rft_id=info:oai/&req.language=eng), Casey Reas & Ben Fry |
| [10PRINT](http://nickm.com/trope_tank/10_PRINT_121114.pdf), Nick Montfort, Ian Bogost, et. al | [Nature of Code](http://natureofcode.com/), Daniel Shiffman |

**Materials and Supplies:** N/A

**Assessable Tasks:**

* Class Participation: Participation includes being on time, asking questions if you need help, and remaining focused on the topic. Learning programming with one 3 hour class per week is challenging, so our time together is extremely valuable. I expect students to remain engaged during class time, including no phones, checking social media, etc.
  + Note: 3 lates = 1 unexcused absence

3 unexcused absences = -1 grade level

* Reading Responses: Readings will be assigned on a weekly basis. Each student will be responsible for choosing one relevant reading one week in the semester for the entire class. I will also periodically assign readings. For every assigned reading, pick one of the readings and write a 100+ word response in Canvas. Responses are casual and are meant to generate discussion and creative thinking. Grading for reading responses will be assessed if reading is posted by the day of class. Late responses will result in a 1 point deduction.
* Homework: Homework will be assigned on a weekly basis and will typically be an application of whatever was covered that day, to be turned in the evening before the next class by posting the gist or github link of the code to the class github page. Grading for sketches will be assessed on if all goals for the work is met, with a minor penalty for tardiness. Do not fall behind schedule, you will have a **very** difficult time catching up.
* Midterm
* Final: The final project will be a polished interactive project. Group work may be possible depending on the project. Finalized constraints will be discussed in class. Grading of the final will reflect the success of a project in relation to the learning outcomes, assignment constraints, and if the project is on time.

**Final Grade Calculation:**

* Class participation & reading: 10%
* Homework sketches: 40%
* Midterm: 10%
* Final: 40%

**Course Outline:**

Week 1 - 8/30 - **What is code, what is programming?**

* Early computer artists
* Control Flow
* Pseudocode
* Storing values and operating on values - variables and functions
* Processing IDE, basic arithmetic, mouse and width/height system variables, console
* Git, github, gist
* *HW: pseudocode exercise & drawing primitives, using variables and arithmetic, proof of debugging using the console; FORM+CODE Ch.1*

Week 2 - 9/6 - **Drawing functions, basic interaction**

* Translation rotation, scaling, and the coordinate plane
* Color, random, additional drawing functions
* Github/Gist/Git refresher
* *HW: interactive visual scene with functions and translations, FORM+CODE Ch. 2*

Week 3 - 9/13 - **Pure functions or side effects, complex data types**

* Coordinate system review, function encapsulation review
* Functions and return types, function parameters
* PImage
* *HW: research and implement a new function; create a repository from terminal and push code*

Week 4 - 9/20 - **Control flow, logic, conditionals, interface**

* Boolean logic, logical operators, if, else, else if, switch
* Simple trigonometry, pythagorean theorem, dist(), buttons
* Repeating patterns, bouncing ball, map()
* *HW: create a button interface, FORM+CODE Ch. 3*

Week 5 - 9/27 - **Loops**

* CHECK IN QUIZ (in class open laptop coding assignment)
  + Pseudocode, variables, functions, scope, conditionals, etc.
* Map, dist, pythagorean refresher
* While loops, for loops, 2D nested loops, 3D nested loops, break, //continue
* *HW: Loop practice, create a dynamic grid pattern, 10PRINT 10 (pick a chapter)*

Week 6 - 10/4 - **Arrays, looping through arrays**

* 10print patterns
* Arrays of values, using arrays in loops, why use arrays
* *HW: Arrays practice; Midterm assigned* 
  + *Create an interactive narrative/ text adventure, or a generative portrait, or a new interface*

Week 7 - 10/11 - **2D arrays, image processing**

* 2d arrays
* Mouse, keyboard, other inputs, ASCII
* Image processing, get, histograms, pixels array, frame buffer
* *HW: Continue work on midterm assignment, FORM+CODE Ch.4*

Week 8 - 10/18 - **Object Oriented Programming**

* **MIDTERM DUE;** very brief presentations of each assignment
* Objects, classes, arraylists
* *HW: Convert your old code to an OOP paradigm, continue FORM+CODE Ch.6*

Week 9 - 10/25 - **Vectors, physics, and simulation**

* Oscillation, trigonometric functions, random vs. gaussian, physics, random walkers
* Particle systems, Conway’s Life, Flocking
* *HW: Elaborate on one of the concepts covered in class, FORM+CODE Ch.5*

Week 10 - 11/1 - **Libraries**

* Review particle systems and physics
* camera, video, slitscan and other techniques
* *HW: FINAL ASSIGNED, concept creation and pseduocode, FORM+CODE Ch.7*

Week 11 - 11/8 - **External data, APIs**

* CSV, XML, JSON
* Web APIs, API keys, HTTP requests
* Threading
* *HW: Continue work on Final*

Week 12 - 11/15 - **Connected Systems**

* Serial data in processing
* Connecting physical computation to the digital
* Introduction to p5.js
* *HW: Continue working on Final*

Week 13 - 11/29 - **Algorithms + Procedural generation**

* Collision, sorting
* Perlin noise
* *HW: Continue working on Final*

Week 14 - 12/6 - **Processing vs. P5.js vs. OpenFrameworks**

* Cross-platform similarities and differences
* Java vs. Javascript, Java vs. C++
* XCode for C++ compilation, Javascript in Sublime Text
* *HW: LAST WEEK FOR FINAL PROJECTS*

Week 15 - 12/13 - ***Final Presentations***

**Resources**

The university provides many resources to help students achieve academic and artistic excellence. These resources include:

* The University (and associated) Libraries: <http://library.newschool.edu>
* The University Learning Center: <http://www.newschool.edu/learning-center>
* University Disabilities Service: [www.newschool.edu/student-disability-services/](http://www.newschool.edu/student-disability-services/)

In keeping with the university’s policy of providing equal access for students with disabilities, any student with a disability who needs academic accommodations is welcome to meet with me privately. All conversations will be kept confidential. Students requesting any accommodations will also need to contact Student Disability Service (SDS). SDS will conduct an intake and, if appropriate, the Director will provide an academic accommodation notification letter for you to bring to me. At that point, I will review the letter with you and discuss these accommodations in relation to this course.

**Making Center**

Faculty who are planning curriculum that makes use of specific resources should contact the Making Center in advance to coordinate.

The Making Center is a constellation of shops, labs, and open workspaces that are situated across the New School to help students express their ideas in a variety of materials and methods. We have resources to help support woodworking, metalworking, ceramics and pottery work, photography and film, textiles, printmaking, 3D printing, manual and CNC machining, and more. A staff of technicians and student workers provide expertise and maintain the different shops and labs. Safety is a primary concern, so each area has policies for access, training, and etiquette that students and faculty should be familiar with. Many areas require specific orientations or trainings before access is granted. Detailed information about the resources available, as well as schedules, trainings, and policies can be found at [resources.parsons.edu.](http://resources.parsons.edu/)

**Grading Standards**

[What follows is Parsons’ grading standards. You should articulate your own policy for work taking other forms (e.g. presentations, critiques, visuals.) Use clear criteria, specifying how both you and your students will know whether they have achieved the learning outcomes].

**Undergraduate**

A student’s final grades and GPA are calculated using a 4.0 scale. Please note that while both are listed here, the 4.0 scale does not align mathematically with the numeric scale based on percentages of 100 points.

A [4.0; 95 – 100%]

Work of exceptional quality, which often goes beyond the stated goals of the course

A- [3.7; 90 – <95%]

Work of very high quality

B+ [3.3; 87 – <90%]

Work of high quality that indicates higher than average abilities

B [3.0; 83 – <87%]

Very good work that satisfies the goals of the course

B- [2.7; 80 – <83%]  
Good work

C+ [2.3; 77 – <80%]

Above-average work

C [2.0; 73 – <77%]

Average work that indicates an understanding of the course material; passable

*Satisfactory completion of a course is considered to be a grade of C or higher.*

C- [1.7; 70 – <73%]

Passing work but below good academic standing

D [1.0; 60 – <70%]

Below-average work that indicates a student does not fully understand the assignments;

Probation level though passing for credit

F [0.0; 0 – <60%]

Failure, no credit

**Graduate**

A Work of exceptional quality

A- Work of high quality

B+ Very good work

B Good work; satisfies course requirements

*Satisfactory completion of a course is considered to be a grade of B or higher.*

B- Below-average work

C+ Less than adequate work

C Well below average work

C- Poor work; lowest possible passing grade

F Failure

GM Grade missing for an individual

*Grades of D are not used in graduate level courses.*

**Grade of W**

The grade of W may be issued by the Office of the Registrar to a student who officially withdraws from a course within the applicable deadline. There is no academic penalty, but the grade will appear on the student transcript. A grade of W may also be issued by an instructor to a graduate student (except at Parsons and Mannes) who has not completed course requirements nor arranged for an Incomplete.

**Grade of Z**

The grade of Z is issued by an instructor to a student who has not attended or not completed all required work in a course but did not officially withdraw before the withdrawal deadline. It differs from an “F,” which would indicate that the student technically completed requirements but that the level of work did not qualify for a passing grade.

**Grades of Incomplete**

The grade of I, or temporary incomplete, may be granted to a student under unusual and extenuating circumstances, such as when the student’s academic life is interrupted by a medical or personal emergency. This mark is not given automatically but only upon the student’s request and at the discretion of the instructor. A Request for Incomplete form must be completed and signed by student and instructor. The time allowed for completion of the work and removal of the “I” mark will be set by the instructor with the following limitations: [You should include one the following standards, depending on the level of your course].

**Undergraduate students:** Work must be completed no later than the seventh week of the following fall semester for spring or summer term incompletes and no later than the seventh week of the following spring semester for fall term incompletes. Grades of “I” not revised in the prescribed time will be recorded as a final grade of “F” by the Office of the Registrar.

**Graduate students:** Work must be completed no later than one year following the end of the class. Grades of “I” not revised in the prescribed time will be recorded as a final grade of “WF” (for Parsons and Mannes graduate students) or “N” (for all other graduate students) by the Office of the Registrar. The grade of “N” does not affect the GPA but does indicate a permanent incomplete.

**Divisional, Program and Class Policies** [You should include the following headings with the recommended text. In addition, you should include any other policies you may have.]

● Responsibility

Students are responsible for all assignments, even if they are absent. Late assignments, failure to complete the assignments for class discussion and/or critique, and lack of preparedness for in-class discussions, presentations and/or critiques will jeopardize your successful completion of this course.

● Participation

Class participation is an essential part of class and includes: keeping up with reading, assignments, projects, contributing meaningfully to class discussions, active participation in group work, and coming to class regularly and on time.

● Attendance

Parsons’ attendance guidelines were developed to encourage students’ success in all aspects of their academic programs. Full participation is essential to the successful completion of coursework and enhances the quality of the educational experience for all, particularly in courses where group work is integral; thus, Parsons promotes high levels of attendance. Students are expected to attend classes regularly and promptly and in compliance with the standards stated in this course syllabus.

While attendance is just one aspect of active participation, absence from a significant portion of class time may prevent the successful attainment of course objectives. A significant portion of class time is generally defined as the equivalent of three weeks, or 20%, of class time. Lateness or early departure from class may be recorded as one full absence. Students may be asked to withdraw from a course if habitual absenteeism or tardiness has a negative impact on the class environment.

Whether the course is a lecture, seminar or studio, faculty will assess each student’s performance against all of the assessment criteria in determining the student’s final grade.

● Canvas

Use of Canvas may be an important resource for this class. Students should check it for announcements before coming to class each week.

● Delays

In rare instances, I may be delayed arriving to class. If I have not arrived by the time class is scheduled to start, you must wait a minimum of thirty minutes for my arrival. In the event that I will miss class entirely, a sign will be posted at the classroom indicating your assignment for the next class meeting.

● Electronic Devices

The use of electronic devices (phones, tablets, laptops, cameras, etc.) is permitted when the device is being used in relation to the course's work. All other uses are prohibited in the classroom and devices should be turned off before class starts.

● Academic Honesty and Integrity

Compromising your academic integrity may lead to serious consequences, including (but not limited to) one or more of the following: failure of the assignment, failure of the course, academic warning, disciplinary probation, suspension from the university, or dismissal from the university.

Students are responsible for understanding the University’s policy on academic honesty and integrity and must make use of proper citations of sources for writing papers, creating, presenting, and performing their work, taking examinations, and doing research. It is the responsibility of students to learn the procedures specific to their discipline for correctly and appropriately differentiating their own work from that of others. The full text of the policy, including adjudication procedures, is found at

[http://www.newschool.edu/policies/#](http://www.newschool.edu/policies/) Resources regarding what plagiarism is and how to avoid it can be found on the Learning Center’s website: <http://www.newschool.edu/university-learning-center/student-resources/>

The New School views “academic honesty and integrity” as the duty of every member of an academic community to claim authorship for his or her own work and only for that work, and to recognize the contributions of others accurately and completely. This obligation is fundamental to the integrity of intellectual debate, and creative and academic pursuits. Academic honesty and integrity includes accurate use of quotations, as well as appropriate and explicit citation of sources in instances of paraphrasing and describing ideas, or reporting on research findings or any aspect of the work of others (including that of faculty members and other students). Academic dishonesty results from infractions of this “accurate use”. The standards of academic honesty and integrity, and citation of sources, apply to all forms of academic work, including submissions of drafts of final papers or projects. All members of the University community are expected to conduct themselves in accord with the standards of academic honesty and integrity. Please see the complete policy in the Parsons Catalog.

● Intellectual Property Rights: [http://www.newschool.edu/policies/#](http://www.newschool.edu/policies/)

NOTE: Writing honest code is not like writing an honest paper. There are many resources, tutorial, sample code, and forums made available to designers and programmers. I fully encourage you to take advantage of available resources. HOWEVER, I will be looking at your code thoroughly each week and will notice if you copy and paste code from another source. Any code taken from other sources ABSOLUTELY MUST be cited with a url and used as a supplement to work that expresses your own vision rather than replicating another’s work.