STEAM Work Experience Program Syllabus - PCC - SPRING 2019

Program Title:
STEAM (Science, Technology, Engineering, Arts, & Mathematics) Work Experience Program.

Spring Term: *April 8th - June 13th, 2019*

Website: STEAMWE.github.io

Staff:
Francesca Frattaroli (STEAM Program Coordinator/Instructor) Francesca.Frattaroli@pcc.edu
- Oversees STEAM WE curriculum, equipment and materials budget, scheduling, and lab access.

Jordan Laurent (Instructor) Jordan.Laurent@pcc.edu
- STEAM WE instructor with experience in design, microelectronics, music, and coding. Oversees TEB 119 STEAM Room access.

Adam Greene-Haley (Instructor) HoodRichardson@gmail.com
- STEAM WE Drone instructor based out of the Airway Science Program. Oversees Airway Science Room Access.

Rakeem Washington (Opening Doors Project Director) Rakeem.Washington@pcc.edu

Julie Stocker (Opening Doors Education Coordinator) Julie.Stocker@pcc.edu
- Oversee Opening Doors Project, manage student payments, administrative, and student issues.

Location:
PCC Cascade Campus, 705 N Killingsworth St, Portland, OR, 97217
- Cascade Fab Lab, Paragon Arts Building
- Margaret Carter STEAM Room, TEB 119

Description:
The STEAM Work Experience Program is an opportunity for students to explore creative and technical fields through hands-on personal and group projects, expert presentations, and self-directed learning. In addition to learning new tools and STEAM skills, students will have the opportunity to develop general workplace skills including teamwork, time and project management, workplace communication, and shop safety.

This program is intended to help students identify their interests as they relate to potential career paths and develop those interests through individualized projects that build relevant skills. Students will be provided with an array of prototyping tools and corresponding safety trainings, personalized project development assistance, and access to a material and equipment budget to realize their projects. Students who successfully document their projects will also be given a platform to build an online portfolio, showcasing their skills and accomplishments.

Program Content and Outcomes:
The STEAM Work Experience Program is a selection of group and individual learning opportunities, in which students can choose to participate in all offerings, or focus in on a particular aspect of the program.

Program Elements:

1. **Tool Mastery**: Students can focus on a mastering a specific tool or set of tools, building out documentation and example work.
2. **Group Projects:** Students can work to contribute to a long-term group project with an established goal.
3. **Independent Projects:** Students (by themselves, or in small groups) can complete a number of guided or self-devised projects that utilize fabrication tools and techniques.
4. **Independent Study**: Students can choose to focus on a specific theme or academic discipline, taking online courses and designing projects that align with a specific field of study.

Group Projects:

1. **Drone Building and Flying Workshop:** Weekly drone workshop where students are able to assemble, program, modify, and fly remote controlled drones. (skills: general fabrication, soldering, electronics, programming, piloting)
2. **Farmbot Project:** Multi-term project where students assemble a garden bed and autonomous gardening robot, select optimal plants for climate, monitor garden, and harvest and sell produce. (skills: general fabrication, electronics, programming, environmental science, agriculture, small business).
3. **Sonic Arts Workshop:** Week-long workshop where students learn basics of Ableton software, recording, and beat mixing techniques. (skills: Audio Technology & Production, Interface Design, creative expression)
4. **Inventor Workshop:** Three-week workshop where students identify real-world problems, design technical solutions, fabricate a prototype, and present it to the public (skills: creative problem solving, technical design, prototyping, documentation, and public speaking).

All students are expected to generate documentation of their work and participate in a weekly progress review. **Students are encouraged to identify a topic or skill that relates to their personal or career interests. Instructors can then help to develop a relevant project path.**

Success in this program is largely dependent upon the time and effort investment of each student, for which there is no set requirement (max. 20hrs/week). However, there are a set of outcomes that a student who actively participates can expect to achieve.

Upon successful completion of this program, students will be able to:

- Identify PCC's career pathway programs & corresponding skill requirements
- Identify and use common measurement and hand tools (Calipers, Measuring Tape, Hammer, Drill, etc.)
- Respect standard shop safety and maintenance protocols
- Operate a 3D Printer, Laser Cutter, Soldering Iron, & CNC Router
- Generate designs using 2D and 3D Modeling Software
- Identify common electronic components and apply basic circuit theory to microelectronic projects
- Apply Design Process, project management, and teamwork techniques to hands-on projects
- Clearly document their skills and projects and be able to explain their accomplishments to a layperson
- Share a portfolio of completed projects and acquired skills to a potential employer or educator

Program Rules and Expectations:
As a work experience program, students will be paid an hourly wage for time spent working on projects and developing skills. This comes with the expectation that students will treat this program as a workplace, adhering to the following professional standards:

- **Treat fellow students as colleagues** - When you can, help your classmates when they are struggling with a problem by sharing your skills and acquired expertise.

- **Avoid swearing and use respectful language** when communicating ideas and disagreements. Even if nobody is being insulted, swearing it is considered highly unprofessional in many workplaces.

- **No phones allowed in the workspace.** Working with hand and power tools requires undivided attention and phones pose a dangerous distraction.

- **Sign in and out when leaving the workspace**. Pay is dependent on attendance- if you do not record your attendance or record it inaccurately, a supervisor will be required to estimate your attendance (which may not be to your benefit).

With these workplace responsibilities, come **additional benefits** not found in many traditional academic courses:

- **There are no minimum attendance requirements**, with the exception of orientations and safety trainings (though lack of participation may make it harder to re-engage ongoing projects).

- **Students can choose which projects to work on** and for how long.

- **Students can submit purchase requests for specific tools** and materials needed for their projects.

- **Students can request 1:1 training for subjects** or technologies not covered in group orientations.

- **Students may make products for sale**, using work experience tools and resources.

Program Content and Schedule:
The instructor reserves the right to revise the class calendar, modify content, and/or substitute assignments in response to institutional, weather, or class situations.

2019 Spring Term: *April 8th - June 13th*

General Weekly Format: *(for students who cannot attend all regular hours, additional hours are available).*

LOCATION:	FAB LAB	FAB LAB	TEB 119	TEB 119
TIME:	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
1PM - 2PM	New Topic Training	Grp Proj. /Ind. Sdy	Special Topic	Drones/Ind. Proj
2PM - 2:45PM	New Topic Training	Grp Proj. /Ind. Sdy	Special Topic	Drones/Ind. Proj
2:45PM - 3:10PM	----------BREAK----------			
3:10PM - 4PM	Group Project	Grp Proj. /Ind. Sdy	Drones/Ind. Proj	Drones/Ind. Proj
4PM - 5PM	Group Project	Grp Proj. /Ind. Sdy	Drones/Ind Proj	Drones/Ind. Proj
ACTIVITY:	New Topic Lecture	Self Directed	Invited Speaker	Weekly Check-In

WEEK	DATES	EVENTS/TOPICS
1	4/08 - 4/11	Orientation Week - Surveys, Tours, Trainings (CNC, 3D Print, Lasercut)
2	4/15 - 4/18	Online Courses, Soldering Group Project, Intro to Drones
3	4/22 - 4/25	CNC Project, Intro to Electronics, Micro Electronics Project, Career Lecture
4	4/29 - 5/2	Sonic Arts Workshop, Hydraulics Project, Artist Lecture
5	5/06 - 5/09	Farmbot Group Project, Environmental Engineer Lecture
6	5/13 - 5/16	Farmbot Group Project Continued, Sociology Lecture
7	5/20 - 5/23	Game Design Project, Entrepreneur Lecture
8	5/27 - 5/30	(No Class Monday) Composite Artist Workshop, Inventor Workshop
9	6/03 - 6/06	Inventor Workshop
10	6/10 - 6/13	Inventor Workshop

Schedule changes from week to week, see course website for detailed, up-to-date schedule

Last Updated 2019-04-06

Accessibility and Accommodations:
PCC is committed to ensuring that classes are accessible. Disability Services [www.pcc.edu/disability/] works with students and faculty to minimize barriers. If students elect to use approved academic accommodations, they must provide in advance formal notification from Disability Services to the instructor.

Title IX/Nondiscrimination:
PCC is committed to creating and fostering a learning and working environment based on open communication and mutual respect. If you believe you have encountered sexual harassment, sexual misconduct, sexual assault, or discrimination based on race, color, religion, age, national origin, veteran status, sex, sexual orientation, gender identity, or disability please contact the Office of Equity and Inclusion at (971) 722-5840 or equity.inclusion@pcc.edu.

Student Rights and Responsibilities:
The Student Rights and Responsibilities Handbook [www.pcc.edu/about/policy/student-rights/] establishes students' freedoms and protections as well as expectations of appropriate behavior and ethical academic work. The Handbook includes items such as the Policy on Student Rights, the Policy on Student Conduct, and the Academic Integrity Policy.

Sanctuary College:
PCC is a sanctuary college. PCC will continue to uphold our legal obligation to protect the privacy rights of all students by observing the federal Family Educational Rights and Privacy Act (FERPA). We will not release non-directory student information unless legally compelled to do so, and will continue to offer FERPA workshops to students to increase awareness of their rights under this law. PCC public safety officers do not and will not enforce federal immigration laws as they do not have the legal authority to do so. Instead, they will remain committed to working to make PCC safe for all.

For more information and resources, see www.pcc.edu/resources/undocumented-students/.