PATERSON PUBLIC SCHOOLS
Preparing All Children for College and Career

Department of College and Career Readiness

Language of Architecture & Construction (Construction Careers Exploration) Curriculum

10.0 Credits

Unit 6: Printing

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Language of Architecture & Construction (Construction Careers Exploration)

Course Description

Language of Architecture and Construction (Construction Careers Exploration) is a 10.0 credit seminar-style course that exposes students to many career industries and fields. The course is split into two sections, (each consisting of 4 units, which are taken in the freshman's year) in which students are actively taking two (four) of the eight topics/units covered during one academic year. These topics include: Graphic Design; Construction; Drafting-General; Freshmen Seminar; Leadership, Education and Training; Printing; Safety; and Automotive.

Students acquire introductory-level knowledge and skills of these disciplines, and allows them to make an informed decision about their continued program of study in a given career field.

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Pacing Guide		
Unit	**Topic**	**Suggested Timing**
COHORT A – 36 weeks of instruction		
Unit 1	Introduction and Overview of Graphic Design	approx. 9 weeks
Unit 2	Introduction and Overview of Construction	approx. 9 weeks
Unit 3	Introduction and Overview of Drafting – General	approx. 9 weeks
Unit 4	Introduction and Overview of Freshmen Seminar	approx. 9 weeks
COHORT B – 36 weeks of instruction		
Unit 5	Introduction and Overview of Leadership, Education and Training	approx. 9 weeks
Unit 6	Introduction and Overview of Printing	approx. 9 weeks
Unit 7	Introduction and Overview of Safety	approx. 9 weeks
Unit 8	Introduction and Overview of Automotive	approx. 9 weeks

Educational Technology Standards

8.1.12.A.3, 8.1.12.D.1, 8.1.12.F.1

- **Technology Operations and Concepts**
  - Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
    Example from unit: Students will create and present industry-related career readiness proposal.
- **Digital Citizenship**
  - Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.
    Example from unit: Students will correctly cite all utilized research, as well as identify appropriate sources.
- **Critical Thinking, Problem Solving, Decision Making**
  - Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.
    Example from unit: Students will assess technology and its use at in the given career field covered in the unit.

Career Ready Practices

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

CRP1. **Act as a responsible and contributing citizen and employee**
Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
Example from unit: Students will articulate skills and practices required of successful employees in the printing industry.

CRP2. Apply appropriate academic and technical skills.
Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
Example from unit: Students will utilize technical skills required of the printing industry.

CRP4. Communicate clearly and effectively and with reason.
Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
Example from unit: Students will articulate working introductory knowledge of printing concepts.

Career Ready Practices

CRP11. Use technology to enhance productivity.
Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Example from unit: Students will utilize technology to transfer printing concepts into a digital medium.

CRP12. Work productively in teams while using cultural global competence.
Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.
Example from unit: Students will work collaboratively to develop materials that are culturally sensitive.

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Differentiated Instruction

Strategies to Accommodate Students Based on Individual Needs

Time/General	Processing	Comprehension	Recall
• Extra time for assigned tasks • Adjust length of assignment • Timeline with due dates for reports and projects • Communication system between home and school • Provide lecture notes/assignments, and tutorials outline	• Extra Response time • Have students verbalize steps • Repeat, clarify or reword directions • Mini-breaks between tasks • Provide a warning for transitions • Video lessons online	• Precise step-by-step directions • Short manageable tasks • Brief and concrete directions • Provide immediate feedback • Small group instruction • Emphasize multi-sensory learning	• Teacher-made checklist • Use visual graphic organizers • Reference resources to promote independence • Visual and verbal reminders • Graphic organizers
Assistive Technology	**Tests/Quizzes/Grading**	**Behavior/Attention**	**Organization**
• Computer/whiteboard • Video lesson • Spell-checker • Text speech software	• Adjusted rubrics for projects • Study guides • Shortened tests • Read directions aloud	• Consistent daily structured routine • Simple and clear classroom rules • Frequent feedback	• Individual daily planner • Display a written agenda • Note-taking assistance • Color code materials

Differentiated Instruction

Strategies to Accommodate Students Based on Content-Specific Needs

- Paired instruction
- Frequent one-on-one, informal and formal meetings
- Frequent revision of individualized goals and objectives
- Extra time for assigned tasks
- Adjust length of assignment
- Timeline with due dates for reports and projects
- Communication system between home and school
- Small group instruction

Enrichment

Strategies Used to Accommodate Based on Students Individual Needs:

- Adaption of Material and Requirements
- Evaluate Vocabulary
- Elevated Text Complexity
- Elevated Projects Rubrics
- Independent Written and Video Online Tutorials
- Projects completed individual or with Partners
- Self Selection of Research
- Tiered/Multilevel Activities
- Online Learning Communities
- Individual Response Board
- Independent Book Studies
- Open-ended activities
- Community/Subject expert mentorships

Assessments

Suggested Formative/Summative Classroom Assessments

- Presentation of unit applicability in professional and education sectors
- Teacher-created Unit Assessments, Topic Assessments, Quizzes
- Industry-applicable DBQs, Essays, Short Answer
- Spot site visits and demonstrations/role-plays
- Projects, Portfolio, Presentations, Prezi, Gallery Walks
- Homework
- Concept Mapping
- Primary and Secondary Source analysis
- Photo, Video, Political Cartoon, Radio, Game Analysis
- Create an Original Song, Animation, Board Game

Interdisciplinary Connections

English Language Arts
- Close reading of unit-specific industry-related content (NJSLSA.R1)
- Develop a proposal to increase recruitment in a given industry (NJSLSA.W2)

Social Studies
- Research the history of careers in field of site assignment (6.1.12)
- Research prominent historical individuals in a given industry/profession (6.2.12)

Fine & Performing Arts
- Create a poster recruiting young people to focus their studies on a specific career or industry (1.2.12)
- Create a brochure for a specific industry (1.2.12)

Math
- Unit topic-specific/ industry applications (N.Q.A.1)
- Unit topic-specific/industry projection scenarios (A.CED.A.1)

Science
- Research and discuss latest developments in unit/industry-specific technology (HS-ETS1-4)
- Investigate applicable-careers within the field of the given unit (9.2.12)

World Language
- Translate unit-specific industry content (7.1.ILA)
- Create a translated index of unit-specific industry vocabulary (7.1.ILA)

New Jersey Students Learning Standards

9.3– Career and Technical Education

Career Cluster: Science, Technology, Engineering & Mathematics (ST)

- 9.3.ST.3: Describe and follow safety, health and environmental standards related to science, technology, engineering and mathematics (STEM) workplaces.
- 9.3.ST.6: Demonstrate technical skills needed in a chosen STEM field.

Career Cluster: Engineering & Technology (ST-ET)

- 9.3.ST-ET.1: Use STEM concepts and processes to solve problems involving design and/or production.
- 9.3.ST-ET.4: Apply the elements of the design process.

Common Career Technical Core (CCTC)

Career Cluster Science, Technology, Engineering, and Mathematics (ST)

- ST.3 – Describe and follow safety, health and environmental standards related to science, technology, engineering and mathematics (STEM) workplaces.
- ST.6–Demonstrate technical skills needed in a chosen STEM field.

Career Cluster Engineering & Technology

- ST-ET.1–Use STEM concepts and processes to solve problems involving design and/or production.
- ST-ET.4 –Apply the elements of the design process.

Common Core State Standards (CCSS)

CCSS - English-Language Arts

Key Ideas and Details:

- CCSS.ELA-LITERACY.RL.11-12.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

Research to Build and Present Knowledge:

- CCSS.ELA-LITERACY.W.11-12.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Range of Writing:

- CCSS.ELA-LITERACY.W.11-12.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences

Course: Language of Architecture & Construction (Construction Careers Exploration) **Unit:** 6- Printing **Grade Level:** 9-12	**Unit Overview:** Printing offers a hands-on introduction to the use of machines, materials, methods, and safety regulations for printing. Craftsmanship is learned through established industry standards including the latest materials, technology, and technological techniques. All skills and techniques acquired within the printing unit are considered by industry professionals to be the fundamental knowledge for students pursuing printing course work and careers.
New Jersey Student Learning Standards (NJSLS): 9.3.12.C.3, 9.3.12.C.5, 9.3.12.C.11, 9.4.12.B. (2). 10 , 9.4.12.B.(2).11 , 9.4.12.B.(2).17; 9.3.ST.3, 9.3.ST.6; 9.3.ST-ET.1; 9.3.ST-ET.4	
Common Career Technical Core (CCTC): ST.3; ST.6; ST-ET.1; ST-ET.4	
Common Core State Standards (CCSS): RL.11-12.1; W.11-12.10; W.11-12.7	

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
Identify and implement safety procedures, printing materials, planning components. **NJSLS:** 9.3.ST.3; 9.3.ST.6; 9.3.ST-ET.1 **CCTC:** ST.3**,** ST.6; ST-ET.1 **CCSS:** RL.11-12.1	What are the safety concerns to be considered when working in a lab setting in school or on the job? What protection can be used in a laboratory environment? What should be part of	• Safe use of tools, equipment, and chemicals. • Safety signage • Maximizing personal productivity • Model methods for maximizing personal productivity in a	**Safety Procedures:** As a class create a safety procedure document that establishes the protocols for the course. **Prezi:** I groups of 2-4 create a prezi outlining the safety procedures, printing materials, and planning components for	**OSHA Safety Procedures Printing Industry: https://www.osha.gov/SLTC/printing_industry/** **Standard Operating Procedures Printing Industries of America: http://www.printing.org/page/10133**

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
	an effective safety program? What characteristics are essential to a functional team? What are the benefits of working in a team environment as opposed to individually? Why is planning an important aspect to project work? How does planning influence efficiency? Why is planning vital print project? How does planning influence the design of a product? How is paper graded? What type of inks are	safe environment. • Applications of various sheet goods • Characteristics of paper and cardstock • The use of inks and solvents • Measurement of layout • Planning the steps for completion of the project.	Printing I. **Plan of Procedure:** Plan a printing project outlining the materials needed and cost of job.	

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
	there? What are the different types of additives and solvents used in printing? What is the difference between fonts?			
Identify and utilize silkscreen materials necessary to complete a project. (i.e. inks, screens, and artwork) **NJSLS:** 9.3.ST-ET.4; 9.3.ST.6 **CCTC:** ST-ET.4; ST.6 **CCSS:** W.11-12.10; W.11-12.7	How do screens get copy? What is the role of silkscreen in the printing industry? What tools are used for the screening process? What shapes and materials can be screened?	• Safe use of inks and solvents • Setup a screen to print one color and three color project • Use silk screen materials to create an original project	**Silk Screen and Photography:** students were given digital cameras and directed to take photographs that would form the basis of their screen prints. Students had the option of either setting up a still life or of taking images of interesting structures within the school building. The photo image was then manipulated in Adobe Photoshop to make a high contrast film positive. Students	**How to Silkscreen Print: http://www.printing.org/page/10133** **Instructables Silk Screen: http://www.instructables.com/id/How-to-Silk-Screen/** **Warhol.org: http://www.warhol.org/education/resourceslessons/Silkscreen-Printing--Schenley-High-School/#ixzz4RVkY0aCA**

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
			combined these photographic images with stenciled areas of color in their final prints. After experimenting with various color combinations students were ready to begin their prints. To make the silkscreen stencils students made a collage in three colors to create a visually interesting and geometrically harmonizing background below the photographic printed layer of their image. Once the collage shapes were determined, students were shown how to carefully cut stencils to mirror those shapes. These shapes formed the basis for the initial screen prints, each one being printed from lightest to darkest. Students eventually	

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
			made their prints using four screens, working from the background color, through the sequence of shapes, finally printing the photographic image. **You-In Society Project:** create a silk screen project that positively impact the community or school by using art.(Create T-Shirts to raise money for a trip or a charity)	
Explore the use of letterpress, engraving, and lithography through the use of the appropriate press, type, and materials. **NJSLS:** 9.3.ST-ET.4; 9.3.ST.6	How does the selection of a font or fonts impact the final letterpress? What is a job case? What are the advantages of letterpress printing? What are the	• Follow printing from its start to present day • Safe use of letterpress • Select appropriate type fonts for the project to be printed • Demonstrate the	**Letter Press Project Design Your Own:** Students will design their own personal project incorporating different typefaces and graphic enhancers. Possible projects include party invitations, Christmas cards, personalized note	**Khan Academy Lithography Process:** https://www.khanacademy.org/partner-content/moma/moma-printmaking/v/moma-lithography-process **Printmaking Through**

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
CCTC: ST-ET.4; ST.6 **CCSS:** W.11-12.7	disadvantages of letterpress printing? What are the safety concerns to be considered when working with an offset press? What safety equipment should be used in a print shop environment? What maintenance should be part of offset press operation? What are the benefits of working in a team environment as opposed to individually? What machines are used for Engraving? What are the highlights of engraving a project?	safe use of an offset press • Strip a plate • Set up water bath • Adjust press when necessary for higher quality work • Safe use and setup of an engraving press • Multiple engravings	cards and stationary, business cards, or other fun projects. **Engraving Project:** students will use both the laser engraver and the high school's high end 3D printer to design and construct a class project designed to sort three different sizes of ball bearings without mechanisms, or basically using gravity. In this project the students use the laser engraver to cut the 2D pieces and they use the 3D printer – which is more sophisticated but also much slower – to print the ramps which help guide the bearings. Lithography Lesson: http://study.com/academy/lesson/lithography-	**the Ages:** http://centralpt.com/upload/417/15224_printmakinglessonplans.pdf **Letterpress Commons:** https://letterpresscommons.com/section/letterpress-printing-instruction/ **Engravers Network:** http://www.engraversnetwork.com/resources/

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
	How does the engraver shape the stock?		lesson-plan.html	
Demonstrate reprographics the operation of various Reprographic machines i.e. Xerox, Minolta etc. **NJSLS:** 9.3.ST-ET.4; 9.3.ST.6 **CCTC:** ST-ET.4; ST.6 **CCSS:** W.11-12.10; W.11-12.7	What are the advantages to reprographics? What are the limitations of reprographics? How do you publish on computer and print with a reprographer?	• Safe use of a reprographer • Collating a project • Binding a booklet	**Performance Test:** Students will individuals demonstrate the ability to safety use of Xerox machines. **Quick Write:** What are the features and uses of reprographic equipment in the corporate setting?	**Structure and Deterioration of Paper-based Materials https://www.nedcc.org/curriculum/lesson.class3.resources.php**
Identify and select stock and print a project using the thermography process. **NJSLS:** 9.3.ST-ET.4; 9.3.ST.6 **CCTC:** ST-ET.4; ST.6 **CCSS:** W.11-12.10; W.11-12.7	What are the safety concerns to be considered when printing thermography? What protection can be used in a laboratory environment? Why use thermography? What are the benefits of	• Business cards • Letterhead • Invitations • Process of Thermography • Setup press	**Letterhead and Business Cards:** Create a personal Letterhead and business cards using thermography. Put a personal spin on your printing. **Invitation:** Create an invitation to an event in	**Thermography and Raised Letter Printing: http://www.easyprinting123.com/thermography_printing.htm** **Thermographic Printing: https://www.youtube.com/watch?v=NCewEUoldLU**

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
	working in a team environment as opposed to individually?		your class demonstrating use of the press and thermography materials. **Journal:** What is the career and cultural significance of printing business cards?	**Thermography as a printing process:** https://www.prepressure.com/printing/processes/thermography
Develop the skills to produce digital prints through the use of programs such as Adobe, Work Publishing and Print Shop to design, layout and print a brochure. **NJSLS:** 9.3.ST-ET.4; 9.3.ST.6; 9.3.ST-ET.1] **CCTC:** ST-ET.4; ST.6; ST-ET.1 **CCSS:** W.11-12.10; W.11-12.7	What are the methods of digital printing? What are the benefits of digital printing? What are the different types of programs used to do digital printing?	• Using programs for graphics i.e. Word, Print Shop, and PageMaker etc. • Designing a multi-page brochure. • Cropping • Sizing	**Journal:** How has printing evolved over time? **Brochure:** Create a brochure for your school using the printing techniques you have learned. **Newsletter**: In groups of 2 create a newsletter for your class to inform the school community of the projects and learning that is taking place. **Demonstration:** In	**Print Technology and Graphic Imaging:** http://www.lcti.org/prospective-student-course/print-technology-graphic-imaging/ **Glossary of Terms:** http://printindustry.com/Glossary.aspx

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
			groups of 2 demonstrate the various digital programs to edit and publish digital printing	

Unit Vocabulary

Paper Stock Weight DPI CMYK RPI Print Types Font Bleed Overprint Monotone Duotone Paper Types Lithography Levigator Limestone Squeegee Aluminum Plate Artist's Proof Proof Registration Slip sheet Solvent	Printmaking Matrix Planographic Screenprint ReliefIntaglio Monotype Monoprint Archival Deckle Tear Bar Waterleaf Paper Watermark Sizing Impression Edition To Pull a print Offset Double print Strike B.A.T Water-based Non-Toxic

Suggested Unit Projects *Choose At Least One*	
Create on of the following comprehensive design documents (resumes, flyers, newsletters, brochures) using page layout software.	Prepare a cover letter and resume for use in seeking internship or job opportunities in the printing industries.

Suggested Structured Learning Experiences	
Virtual Field Trip to MODA: Museum of DXesign http://www.museumofdesign.org/field-trips-1/	New York Times Printing Plant College Point, Queens Contact Deirdre Deignan at (718) 281-7388 or by e-mail: deignd@nytimes.com.