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# Aspire Lionel Wilson College Preparatory Academy - Design Pathway Program of Study

**Focus Area:** *Design for Social Change*

**Partners:** [Workday](#), [Ideo/The Teachers Guild](#), [Trellis Education](#), [Peralta College District](#)

<b>Pathway Vision and Mission</b>	<p><b>What is the instructional vision and desired experience for students that will drive the pathway?</b></p> <p>As a guide to our belief and action, the pathway vision is to develop <i>design thinkers that are literate, independent learners who are organized, critical, and persistent problem-solvers</i>. Our scholars develop a unique and critical <i>creative</i> identity so that they can meaningfully <i>innovate</i> in <i>collaborative</i> ways.</p> <p>All scholars, will demonstrate that they can achieve academic and CTE excellence in Product Innovation and Design by showing that they have the confidence to participate in creating a more desirable future, and are equipped with a process to create innovative breakthroughs by integrating strategies from design thinking to meet the complex humans needs of the 21st century. Scholars will deeply understand the social implications of their work and use the design skills they develop to give back to their community and become transformational agents of change. As graduates, will determine their personal path after high school, draw on meaningful work-based learning experiences to guide and motivate their path to and through college and career. Scholars will use the skills and habits of mind they learn as part of the design pathway to become more effective in whatever career they choose.</p>				
<b>Pathway COP Meeting Time:</b> 2x/ month;Friday B	<b>9th Grade Program</b> Grade level meeting time:	<b>10th Grade Program</b> Grade level meeting time:	<b>11th Grade Program</b> Grade level meeting time: Th 6th	<b>12th Grade Program</b> Grade level meeting time:	<b>Graduate Pathway Outcomes</b> (Student Learning Outcome = graduate requirements)
<b>Academic Core</b>	English 9 Spanish 1 or 2 Biology Integrated Math 1	English 10 World History Physics Integrated Math 1	English 11 US History Chemistry Integrated Math 1 Computer Science	English 12/ERWC Government/Economics Statistics or AP Calculus College Readiness Anatomy and Physiology	All scholars are accepted to and prepared to succeed at a four-year university as well as prepared to succeed in careers beyond college.
<b>Pathway Core Classes</b>	Design 1: Designing for Environmental Stewardship (full year) <b>Design 1 = Intro to Engineering Design (PLTW)</b>	Design 2: Designing for Social Action (full year) <b>Design 2 = Engineering Design and Development (PLTW)</b>	Design 3: Designing for Social Interaction (full year) <b>LWP Design 3 = Civil Engineering and Architecture (PLTW)</b>	<b>Design 4: Designing for Social Entrepreneurism (full year)</b> <b>CTE Capstone LWP Design 4 = Computer Integrated Manufacturing</b>	All scholars have a well-thought out and meaningful plan for their education and career path after high school that has been informed by their pathway experiences in high school. (Created throughout their pathway experience in collaboration with their career counselor and presented and defended in their senior portfolio exhibition).
<b>Pathway Grade Level Driving Question</b>	How can we, as stewards of our environment, design socially sustainable solutions that mitigate human impacts?	How can we, as social activists, use paper mechanics to create kinetic art that expresses a design solution to a social issue in our community?	How can we, as socially conscious innovators, design solutions that enhance social interactions within our community?	How can we, as social entrepreneurs, create and market sustainable solutions that support, enhance, and leverage the social assets in our community?	All scholars are prepared to use design thinking and the engineer process be resilient agents of change in their communities.

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<p><b>Dual Enrollment</b> Project Lead the Way (PLTW) Course Description</p>	<p>n/a Students dig deep into the engineering design process, applying math, science, and engineering standards to hands-on projects. They work both individually and in teams to design solutions to a variety of problems using 3-D modeling software, and use an engineering notebook to document their work.</p>	<p>n/a The knowledge and skills students acquire in Intro to Engineering and Design come together in Engineering Design and Development as they identify an issue and then research, design, and test a solution, ultimately presenting their solution to a panel of engineers. Students apply the professional skills they have developed to document a design process to standards, completing Engineering Design and Development ready to take on any post-secondary program or career.</p>	<p>Communication Studies Students learn important aspects of building and site design and development. They apply math, science, and standard engineering practices to design both residential and commercial projects and document their work using 3-D architectural design software.</p>	<p>Manufactured items are part of everyday life, yet most students have not been introduced to the high-tech, innovative nature of modern manufacturing. This course illuminates the opportunities related to understanding manufacturing. At the same time, it teaches students about manufacturing processes, product design, robotics, and automation. Students can earn a virtual manufacturing badge recognized by the National Manufacturing Badge system.</p>	
<p><b>Dual Enrollment Laney</b> <b>Bio</b> <b>Manufacturing</b> <b>Architecture</b></p>	<p>Arch 10</p>	<p><b>Bio 75</b> Arch 13, Arch 107</p>	<p><b>Chem 30A, Math 208</b> CONMT20, Arch 35</p>	<p><b>Bio 76, Bio74</b> Arch 104A</p>	<p><b>Student Outcome Option For both pathways at Laney</b> 13 Fall: GE Area 1, 2, 3, 4a 13 Spring: GE Area 4b, 4c, 4d, 5 <b>AS Degree upon Successful Completion</b></p>
<p>Integrated Projects/ Common Performance Assessments  NGSS Alignment  CTE Alignment</p>	<p>Big Idea Framing environmental stewardship as a design thinking challenge where the design process can be applied for sustainable solutions.  Objective Students will be able to: 1) create examples of the core competencies of social- emotional learning; 2) describe why human needs are the primary driver of effective design; and 3) assess common classroom needs in order to define a problem and ideate solution ideas.</p>	<p>Big Idea Providing opportunities to experience and create art as a vehicle for cultural literacy and social action.  Objective Students will develop a mindset of concern for their community by 1) engaging with primary and secondary sourced community data; 2) identify root causes; 3) Use 2-D and 3_D kinetic art to expresses a sustainable solution to a focus social issue.</p>	<p>Big Idea Empowering students to take ownership of their educational experience to become college and career ready.  Objective Students will engage in primary research of their community to 1) frame a whole-school re-imagining; 2) synthesize input and feedback from stakeholders; 3) propose an innovative, learner-driven school transformation initiative to Aspire District Leaders.</p>	<p>Big Idea Drawing upon the features of sustainability as it relates to communities, design an enhancement that leaves an aspect of the community more sustainable and beneficial than when initially encountered.  <u>Cross-Curricular Integration</u> English 12-Explore disparity and socio economic themes expressed in various live presentations (Theater, Spoken Word, etc). Write a synthesis paper exploring common threads.</p>	

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	<p><u>Cross-Curricular Integration</u> English 9 - Complete a research paper that analyses a perspective or argues a point about the potential impact of a proposed environment/community solution.</p> <p>Biology -Using concepts of biologically-driven design protocols (i.e. CRISPR), create a presentation to address an application that has human or environmental impacts.</p> <p>Algebra - Explore that foundations of Algebra as the basis for mathematical models in design. Create mathematical models that represent constraints and considerations in design solutions.</p> <p><u>Standards</u> NGSS HS-PS3-3 Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.</p> <p>CTE 1 - Apply appropriate technical skills and academic knowledge 5 - Utilize critical thinking to make sense of problems and persevere in solving them</p>	<p><u>Cross-Curricular Integration</u> English 10 - Create analysis of case studies of various community infrastructure projects. Course will cover six case studies and will provide students with opportunities to enhance skills such as oral and written communication and project management.</p> <p>Geometry - Study geometric designs found in nature that can be effectively incorporated into art.</p> <p>Physics - Investigate impact of forces on various structural designs</p> <p><u>Standards</u> NGSS HS-PS2-6 Communicate scientific and technical information about why the molecular level structure is important in the functioning of designed materials.</p> <p>CTE 9 - Work productively in teams while integrating cultural and global competence 10 - demonstrate creativity and innovation</p> <p>A6.0 Understand methods used to analyze simple structures</p>	<p><u>Cross-Curricular Integration</u> English 11- Create a technical writing piece that applies writing strategies in the context of change management. The focus is on the basic problem-solving activities that underlie effective writing, many of which are similar to those underlying project ware development.</p> <p>History - Complete a research paper that analyses community and demographic needs and services in various historical periods to inform and contextualize impacts, applications and outcomes of social interactions.</p> <p>Algebra II - Using software and hardware technologies, create a presentation that uses piecewise functions to analyse the cost-effectiveness of selected community services.</p> <p>Chemistry - Create a map of Oakland that highlights and annotates relevant chemistry of selected local environmental issues.</p> <p><u>Standards</u> NGSS HS-ETS1-2 Design a solution to a complex real-world problem by breaking it down into smaller, more</p>	<p>Government - Complete a research paper on city planning decisions in Oakland and how these decisions have impacted marginalized members of the community.</p> <p>Statistics - Complete a statistical analysis of Oakland census data over a specified period to identify patterns and draw conclusions relevant to student identified issues.</p> <p>AP Calculus - Create a multimedia presentation that explores an application where engineers directly use calculus in their daily practice or use computer programs based on calculus that simplify engineering design.</p> <p>Anatomy and Physiology- Create a solution to a genetic challenge using CRISPR and recombinant DNA and genetic engineering principles.</p> <p><u>Standards</u> NGSS HS-LS2-7</p>	
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	<p>C10.0 Understand the methods of applying text to a drawing</p> <p>C10.4 Plan, prepare, and interpret drawings and models through traditional drawing or computer-aided design (CAD) techniques</p>	<p>A7.0 Understand the properties of structural materials</p> <p>A6.3 Interpret structural design considerations, including load bearing relationships of shear walls, columns, and beams</p> <p>A7.1 Understand the integration of architectural factors such as soil mechanics, foundation design, engineering materials, and structure design.</p>	<p>manageable problems that can be solved through engineering.</p> <p>HS-ESS3-4 Evaluate or refine a technological solution that reduces impact of human activities on natural systems.</p> <p>CTE 4. Apply technology to enhance productivity</p> <p>C9.0 Understand the tolerance relationships between mating parts</p> <p>C9.3 Use tolerancing in an engineering drawing</p>	<p>Design, Evaluate, and refine a solution for reducing impacts of human activities on the environment and biodiversity</p> <p>CTE 2 - Communicate clearly, effectively, and with reason</p> <p>A2.0 Compare theoretical, practical, and contextual issues that influence design</p> <p>A2.1 Describe the influence of community context and zoning requirements on architectural design</p> <p>A2.2 Understand the ways in which sociocultural conditions and issues influence architectural design</p> <p>A2.3 Compare theoretical and practical effects of human and physical factors on the development of architectural designs</p>	
<p>Defenses or Capstones</p>	<p>Each student presents their integrated project to a panel of students, staff, and community members as part of the end of year Exhibition presentation.</p>	<p>Each student presents their integrated project to a panel of students, staff, and community members as part of the end of year Exhibition presentation.</p>	<p>Junior Portfolio Presentation -present about learnings and experience from internship</p> <p>Industry panel for capstone presentations</p>	<p>Senior Portfolio Presentation -Identify social/community challenge and design an engineering solution -create the solution -career and college path presentation based on design work</p>	

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				Industry panel for capstone presentations	
Other Courses / Electives	n/a	n/a	AP Biology Ethnic Studies	AP Calculus AP Biology Ethnic Studies	
Other Student Experiences  (post-session, intersession, rituals, class trips, assemblies)	<a href="#">First Lego League</a>  <a href="#">The Collaborative Haptics &amp; Robotics in Medicine (CHARM) Lab</a>	Careers in STEM at UC Berkeley: Mini University Tours	<a href="#">Alameda County Science and Engineering Fair</a>  <a href="#">Code.org</a>	<a href="#">Alameda County Science and Engineering Fair</a>  <a href="#">Oakland Chamber of Commerce</a>  <a href="#">Oakland Museum of California</a>  <a href="#">City of Oakland Planning and Zoning Commission</a>	
Work Based Learning	Brown Bag Lunch Events - Guest Speaker Exposure  Guest Speakers: Engineers and Designers “How I use Design Thinking and the Engineer Process”  Laney College Engineering, Design and Production Department Tours  College Real Talks event including industry speakers	Career Exploration Visits  <b>Commercial/Industrial Designer CAD Designer Model Maker Product Developer Product Manager</b>  College Real Talks event including industry speakers	<b>Semester-long Engineering Externship (extended job shadow)</b>  <b>Students choose from a developed selection of opportunities in which they are interested</b>  College Real Talks event including industry speakers	<b>Semester-long College and Career Related Internship</b>  <b>Students choose from a developed selection of opportunities with which they are matched.</b>  College Real Talks event including industry speakers	
College Exposure	<b>Grade Level Partner SF State</b> <b>-Engineering Department</b> <b>-Health Equity Institute</b>  College trip to Stanford	<b>Grade Level Partner UC Berkeley</b> <b>-Engineering Department</b> <b>-Lawrence Hall of Science</b>  College trip to SF State University	<b>Grade Level Partner Stanford University</b> <b>-Computer Science Engineering Department</b>  College trip to UC Davis	<b>Grade Level Partner Laney</b> <b>-Construction Management</b> <b>-Architecture</b> <b>-Engineering</b>  College trip to Sacramento State	

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	College Real Talks event including speakers from UCs, CSUs, CCs, private universities, and technical programs	College Real Talks event including speakers from UCs, CSUs, CCs, private universities, and technical programs	College Real Talks event including speakers from UCs, CSUs, CCs, private universities, and technical programs	College Real Talks event including speakers from UCs, CSUs, CCs, private universities, and technical programs	
Personalized Supports	<p>Out of class and embedded EL and SPED supports.</p> <p>Small group literacy intervention; small group and individualized supports based on RTI model.</p> <p>Multi-year advisory model with student led conferences creating support plans with families.</p> <p>Pathway course includes initial career and college planning.</p>	<p>Out of class and embedded EL and SPED supports.</p> <p>Small group literacy intervention; small group and individualized supports based on RTI model.</p> <p>Multi-year advisory model with student led conferences creating support plans with families</p>	<p>iMentor mentoring from industry partners for all 11th graders</p> <p>Out of class and embedded EL and SPED supports.</p> <p>Small group literacy intervention; small group and individualized supports based on RTI model.</p> <p>Multi-year advisory model with student led conferences creating support plans with families</p>	<p>iMentor mentoring from industry partners for all 12th graders</p> <p>One-on-one career planning mentoring by school staff as part of the senior portfolio</p> <p>Out of class and embedded EL and SPED supports.</p> <p>Small group literacy intervention; small group and individualized supports based on RTI model.</p> <p>Multi-year advisory model with student led conferences creating support plans with families</p>	
Summer & Expanded Learning Time	<p><b>Stanford SMASH Courses - rigorous engineering, math and science enrichment</b></p> <p><b>Academic Talent Development Program Courses - UC Berkeley: Minds, Brains and Computers</b></p> <p><b>Introduction to Biotechnology</b></p>	<p><b>Stanford SMASH Courses - rigorous engineering, math and science enrichment</b></p> <p><b>Academic Talent Development Program Courses - UC Berkeley: Architectural Design</b></p> <p><b>Peralta College District Courses- 3-D Visual Design</b></p> <p><b>Architectural Drafting and Design</b></p> <p><b>Introduction to Computer Information Systems</b></p>	<p><b>Stanford SMASH Courses - rigorous engineering, math and science enrichment</b></p> <p><b>Academic Talent Development Program Courses - UC Berkeley: Web Development</b></p> <p><b>Elements of Web Design</b></p> <p><b>Peralta College District Courses- Introduction to Social and Cultural Anthropology</b></p> <p><b>Introduction to Systems Analysis and Design</b></p>	n/a	

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			Human Values/Ethics Structure and Interpretation of Computer Programs		
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