

Aspire Lionel Wilson College Preparatory Academy - Engineering Pathway Program of Study

Focus Area: Engineering for Social Change

Pathway Vision	What is the instructional vision and desired experience for students that will drive the pathway? All scholars will demonstrate that they can achieve academic and CTE excellence by showing that they are prepared to succeed in the rigorous and high-paying field of engineering. At the same time, scholars will deeply understand the social implications of their work and use the engineering skills they develop to give back to their community and become transformational agents of change. As graduates determine their personal path after high school, they will draw on meaningful work based learning experiences to guide and motivate their path to and through college. Scholars will use the skills and habits of mind they learn as part of the engineering pathway to become more effective in whatever career they choose.						
Pathway COP Meeting Time: 2x/ month	9th Grade Program Grade level meeting time:	10th Grade Program Grade level meeting time:	11th Grade Program Grade level meeting time:	12th Grade Program Grade level meeting time:	Graduate Pathway Outcomes (Student Learning Outcome = graduate requirements)		
Academic Core	English 9 Spanish 1 or 2 Biology Algebra	English 10 World History Physics Geometry	English 11 US History Chemistry Algebra 2	English 12/ERWC Government/Economics Statistics or AP Calculus College Readiness AP Biology	All scholars are accepted to and prepared to succeed at a four-year university as well as prepared to succeed in careers beyond college.		
Pathway Core Classes	Introduction to Engineering for Social Change (full year)	Principles of Structural Engineering (full year)	Principles of Software Engineering (full year)	Principles of Civil and Environmental Engineering (full year)	All scholars have a well-thought out and meaningful plan for their education and career path after high school that has been		
Pathway Grade Level Theme	Health and Human-Centered Design Engineering	Transportation Systems Design Engineering	Human Impacts and Software Engineering	Habitat Engineering	informed by their pathway experiences in high school. (Created throughout their senior year in collaboration with their mentor and presented and defended in their senior		
Dual Enrollment CoA On-Site Electives	n/a	n/a	Computer information Systems Communication Studies Sociology	Public Speaking Argumentation Human Values/Ethics	portfolio). All scholars are prepared to be resilient agents of change in their communities.		
Integrated Projects/ Common Performance Assessments	Health Solutions Through Robotics Design, build, and refine actions of	Designing Safer and More Efficient Transportation Infrastructure	Human Impact Solutions Plan, prepare, and interpret	Tiny House Design and EngineeringUnderstand the significance of			
NGSS Alignment	a software-mediated device that transforms one form of energy into	Design, build and test a structure designed to facilitate	drawings and models for an engineering solution through	sustainable building design practices that incorporate			



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	another to accomplish a health and	transportation. Structures includes	computer aided design (CAD)	beneficial energy and
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CTE Alignment	wellness related task	bridges, tunnels, and roadways.	techniques.	environmental design policies.
	Cross-Curricular Integration	Cross-Curricular Integration	Cross-Curricular Integration	Cross-Curricular Integration
	English 9 - Complete a research	English 10 - Create analysis of case	English 11- Create a technical	English 12
	paper that analyses a perspective	studies of various infrastructure	writing piece that applies writing	
	or argues a point about the	projects. Course will cover six	strategies in the context of	Government - Complete a research
	potential impact of a proposed	case studies and will provide	software engineering. The focus is	paper on city planning decisions in
	health/wellness engineering	students with opportunities to	on the basic problem-solving	Oakland and how these decisions
	solution.	enhance skills such as oral and	activities that underlie effective	have impacted marginalized
		written communication and	writing, many of which are similar	members of the community.
	Biology - Using concepts of	project management.	to those underlying software	inclusers of the contrainty.
	biological engineering, create a		development.	Statistics - Complete a statistical
	presentation to address the	Geometry - Study geometric		analysis of Oakland census data
	"Grand Challenges for Engineering"	designs in architecture to	History - Complete a research	over a specified period to identify
	identified by the National Science	determine necessary/appropriate	paper that analyses community	patterns and draw conclusions
	Foundation.	load bearing ability for different	and demographic needs and	relevant to student identified
		architectural challenges	services in various historical	issues.
	Algebra - Explore that foundations		periods to inform and	
	of Algebra as the basis for	Physics - Investigate impact of	contextualize proposed approaches	AP Calculus - Create a multimedia
	mathematical analysis in	forces on various structural designs	and applications of software	presentation that explores an
	Engineering. Create mathematical		engineering	application where engineers
	models that represent constraints	<u>Standards</u>	5 5	directly use calculus in their daily
	and considerations in engineering	NGSS	Algebra II - Using software and	practice or use computer programs
	5 5	HS-PS2-6	hardware technologies, create a	based on calculus that simplify
	<u>Standards</u>	Communicate scientific and	presentation that uses piecewise	engineering design.
	NGSS	technical information about why	functions to analyse the	
	HS-PS3-3	the molecular level structure is	cost-effectiveness of selected	AP Biology - Create a solution to a
	Design, build, and refine a device	important in the functioning of	community services	genetic challenge using CRISPR and
	that works within given constraints	designed materials.		recombinant DNA and genetic
	to convert one form of energy into		Chemistry - Create a map of	engineering principles.
	another form of energy.	CTE	Oakland that highlights and	
		9 - Work productively in teams	annotates relevant chemistry of	
	CTE	while integrating cultural and	selected local environmental	
	1 - Apply appropriate technical	global competence	issues.	
	skills and academic knowledge			



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Focus Area: Engineering for Social Change

Other Courses / Electives	n/a	n/a	AP Biology Ethnic Studies	-career and college path presentation based on design work Industry panel for capstone presentations AP Calculus AP Biology Ethnic Studies	
Other Student Experiences (post-session, intersession, rituals, class trips, assemblies)	First Lego League The Collaborative Haptics & Robotics in Medicine (CHARM) Lab	Engineer Alliance for the Arts California Academy of Science - Earthquakes Division	Alameda County Science and Engineering Fair Code.org	Alameda County Science and Engineering Fair Oakland Chamber of Commerce Oakland Museum of California City of Oakland Planning and Zoning Commission	
Work Based Learning	Brown Bag Lunch Events - Guest Speaker Exposure Guest Speakers: Community service providers: firefighter paramedic police officer forensic investigator College Real Talks event including industry speakers	Career Exploration Visits BART Offices Great America Roller Coaster Design Department Construction Site Oakland Airport Earthquake Simulator Laboratory College Real Talks event including industry speakers	Semester-long Engineering Externship (extended job shadow) College Real Talks event including industry speakers	Semester-long College and Career Related Internship College Real Talks event including industry speakers	
College Exposure	Grade Level Partner SF State - <u>Engineering Department</u> - <u>Health Equity Institute</u>	Grade Level Partner UC Berkeley <u>-Engineering Department</u> <u>-Lawrence Hall of Science</u>	Grade Level Partner Stanford University	Grade Level Partner Laney <u>-Construction Management</u> <u>-Architecture</u>	



Aspire Lionel Wilson College Preparatory Academy - Engineering Pathway Program of Study

Focus Area: Engineering for Social Change

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



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Architectural Drafting and Design Introduction to Computer Information Systems	Peralta College District Courses- Introduction to Social and Cultural Anthropology Introduction to Systems Analysis and Design Human Values/Ethics	
	Structure and Interpretation of	
	Computer Programs	