ENGINEERING CAREER LAUNCH PROGRAM PROPOSAL

Clark College, Washington State University-Vancouver, & SEH America Partnership

Partners

Clark College
Washington State University-Vancouver
Shin Etsu Handotai (SEH America)

INSTITUTION **CLARK COLLEGE**

PROPOSED PROGRAM **ENGINEERING CAREER LAUNCH PROGRAM**

PROGRAM CIP **40.0101** PROGRAM EPC (Legacy)

PLAN CODE **PHST2AS / CHEBCAS / EECCEAS / MEEMCAS** NAICS Code **541330**

Please note: Registered Apprenticeship programs become automatically endorsed for Career Launch. You need not submit an application.

CONTACT INFORMATION

Name: Dr. Sachi Horback

Title: Vice President of Instruction

Address: 1933 Fort Vancouver Way, BHL 126 Vancouver, WA 98663

Telephone: 360.992.2217

Fax:

Email: shorback@clark.edu

Sachi Horback

Chief Academic Officer

8/10/2020

Date

Application contact:

Scott A. Copeland
Associate Director, College Relations and Policy Guidance
Education Division
Washington State Board for Community and Technical Colleges
Office: 360-704-4397
Cell: 360-791-6026

Applications reviewed monthly and are due the first business day of the month.

Electronic submissions only to scopeland@sbctc.edu

INSTITUTION **WASHINGTON STATE UNIVERSITY-VANCOUVER**

PROPOSED PROGRAM **ENGINEERING CAREER LAUNCH PROGRAM**

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CONTACT INFORMATION

Name: Dr. Renny Christopher

Title: Vice Chancellor for Academic Affairs

Address: 14204 NE Salmon Creek Avenue, VDEN #208, Vancouver, WA

Telephone: 360.546.9583

Fax:

Email: renny.christopher@wsu.edu

Chief Academic Officer

10-6-2020
Date

Application contact:

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Program Checklist

P1. Program description including length of program in years and total hours (including split between classroom and worksite).

Program Description: Clark College's engineering department has one of the largest and most affordable transfer programs in Washington, allowing students to build a solid foundation in their discipline while taking advantage of small class sizes that afford one-on-one interaction with faculty. In fact, Washington State University, Portland State University, and University of Washington actively recruit Clark students for their engineering programs because of the proven quality of the Clark students and high rate of completion at four-year universities.

Clark's program offers students hands-on projects each quarter where they apply theory to real-world scenarios. Instructors maintain close ties with learning institutions to ensure Clark students take only those courses necessary to become junior-ready upon transfer. In addition to Washington four-year universities, Clark College engineering students also typically transfer to University of Portland, and Oregon State University. Our students also transfer to Embry-Riddle Aeronautical, and Purdue universities, and Rose Hulman Institute of Technology.

Clark College offers an Associate of Science Transfer – AST2. It provides the foundation for a four-year Bachelor of Science engineering degree program with a focus in mathematics, chemistry, physics, and engineering. Students can pursue Major Ready Pathway (MRP's) associate degrees in:

- Bioengineering and Chemical Engineering
- Computer and Electrical Engineering
- Mechanical, Civil, and Aeronautical Engineering
- Computer Science and Engineering

Length of Program: 8 quarters, 24 months.

Total Hours: 110 Hours.

P2. Estimated number of hours per week at worksite and in classroom (this approach may shift throughout the program).

Hours per week at worksite: 20-29 hours. Hours will vary greatly to accommodate course load.
Hours per week in classroom: 16 hours in classroom; 2-3 hours in structured lab environment.

P3. Demonstration of labor market demand for specified skills/career in local region

The Engineering Career Launch Program addresses the occupations within Engineering, Except Drafters occupation (17-30XX).

Clark College is located within the Portland-Hillsboro-Vancouver metropolitan area, which means that the economic region includes a broader six county region (Clark, Skamania, Klickitat, Multnomah, Washington and Clackamas). Within this economic region, there were 6,772 jobs in 2019. There are 770 annual openings, with only 402 annual completions in this broader region; this creates an annual workforce shortage of 368. From January 2019 to May 2020, there were 3,191 unique job postings – from 708 employers. This represented 519 jobs posted per month, which resulted in 202 monthly hires, indicating increased demand to address workforce needs.

Directly within Southwest Washington (Clark, Skamania, and Klickitat counties), there were 542 jobs in 2019. From January 2019 to May 2020, there were 358 unique job postings – from 147 employers. This represented 52 jobs posted per month, which resulted in 17 monthly hires, indicating increased demand to address workforce needs.

Therefore, the Engineering Career Launch Program creates intentional career pathways for new and incumbent workers to address this workforce shortage.

P4. Projected count of student enrollment, student completion, and anticipated employer participation for 5 years, post-pilot.

Engineering Students

	Baseline	**Year 1** (2020-2021)	**Year 2** (2021-2022)	**Year 3** (2022-2023)	**Year 4** (2023-2024)	**Year 5** (2024-2025)
Student Headcount	1,118	1,138	1,158	1,178	1,198	1,218
Full-Time Equivalent Student (FTES)	639	651	663	675	687	699
Completions	80	82	84	86	88	90
Employer Participation	1	1	1	2	3	3

With this partnership, in Year 1, two engineering students will participate in the Career Launch partnership at Clark College, with additional cohorts added each year. Student cohorts will continue through transfer to WSU-V, while maintaining employment at SEH America.

WSU-V verified (as evidenced in WSU-V Letter of Commitment) that students coming through the Engineering Career Launch Program are guaranteed admission to the WSU Vancouver ENCS Programs, provided they meet WSU's transfer requirements (e.g., GPA, transferrable credits).

To expand opportunities for engineering students, Clark and WSU-Vancouver will work to identify additional employer partners that can maximize student participation in the paid employment opportunity. With expansion, the hope is to model after the successful MECOP Inc. program with Oregon State University. In the MECOP Inc. model – formerly known as the Multiple Engineering Cooperative Program, member companies have an integral role in the continual improvement of curriculum based on assessment of students and future of the work.

P5. Concise description of development process to create the Career Launch program (e.g., who was involved, when, how was the program piloted, etc.)

Clark College and SEH America originally partnered for the pilot in 2011 – and now Career Launch endorsed – Semiconductor & Electronics Manufacturing Program. Building on the success of that partnership, SEH America expressed interest in developing a similar partnership for the Engineering Program to support their engineering pathway.

Clark College Engineering Professor Tina Barsotti coordinated with Natalie Pacholl at SEH America to design an earn-and-learn model for students to be employed at SEH America and attending classes at Clark College concurrently.

Building on the success of the Mechatronics Program partnership, we have discovered a desire for SEH America incumbent workers to also participate in the program. Clark College sees this increased demand as a proof of concept for the program and will look to increase our capacity in the near future.

P6. Signed letter of endorsement from all relevant partners, stakeholders and regional networks (including employers, labor organizations, academic institutions, community-based organizations, individuals, and other relevant stakeholders in support of the proposed Career Launch program). Regional network endorsement preferred.

Letters enclosed on subsequent pages are from the following partners:

- Clark College
- Washington State University - Vancouver
- Educational Service District 112 (Regional Network)
- Workforce Southwest (Program Intermediary)
- Career Connect Southwest

SEH America endorsement of the Career Launch Program are included in Employer Commitment Letters for I-R9 on Page 15.

CLARK COLLEGE
EST. 1933

August 10, 2020

To the Career Launch Endorsement Review Team:

I write this letter to affirm Clark College's institutional commitment to the Engineering Career Launch Program, with the initial partnership with SEH America. This program provides students with industry-defined curriculum and meaningful, high-quality on-the-job experience during their educational pathway from Clark College through Washington State University - Vancouver.

I am proud to say that this program also supports Clark College's strategic plan in the core themes of academic excellence, social equity and economic vitality as well as the values of social justice, partnerships, and innovation. The Engineering Career Launch Program exemplifies this commitment through implementation of this creative and agile strategy to enhance student learning, and alignment of the Engineering program to meet regional workforce needs.

The Engineering Career Launch Program is applying for endorsement between Clark College and SEH America. Students concurrently enroll in the Clark College Engineering program and work 25 hours per week at SEH America. To ensure that all students have the resources to address academic and non-academic issues, Clark College provides dedicated wrap-around student support to meet their individualized needs. This comprehensive program, with intentional integration of course curriculum and work-based learning opportunities, prepares students to successfully transfer to a baccalaureate engineering program, and then enter the workforce with the knowledge, skills and abilities to be successful as an engineer.

Building on the success of the Semiconductor & Electronics Manufacturing Technician Career Launch Program, the partnership between Clark College and SEH America will provide additional career pathways for students to support local industry. Upon endorsement, all levels of leadership here at Clark College are confident that the implementation will continue to support the region's need for engineers well into the future.

Sincerely,

Dr. Karin Edwards
President
Clark College

WASHINGTON STATE UNIVERSITY VANCOUVER | Office of Academic Affairs

October 5, 2020

To the Career Launch Endorsement Review Team:

I am writing to affirm Washington State University (WSU) Vancouver's institutional commitment to the Engineering Career Launch Program, with the initial partnership with SEH America. This program provides students with industry-defined curriculum and meaningful, high-quality on-the-job experience during their educational pathway from Clark College through WSU Vancouver. This program also supports WSU Vancouver's strategic plan, particularly the core goals of student success and community engagement. The program will enhance WSU Vancouver's efforts to build creative partnerships that drive economic development in the region. The Engineering Career Launch Program exemplifies such partnerships through its creative and agile strategy to enhance student learning and alignment of the Engineering program to meet regional workforce needs.

The Engineering Career Launch Program is applying for endorsement among Clark College, WSU Vancouver, and SEH America. Students concurrently enroll in the Clark College Engineering program and work 25 hours per week at SEH America. Upon graduation from Clark College, students transfer into the WSU Vancouver Engineering Program and maintain employment at SEH through graduation. Students coming through the Engineering Career Launch Program are guaranteed admission to the WSU Vancouver ENCS Programs, provided they meet WSU's transfer requirements (e.g., GPA, transferrable credits). This comprehensive program, with intentional integration of course curriculum and work-based learning opportunities, prepares students to successfully enter the workforce with the knowledge, skills and abilities required to be successful as an engineer.

All levels of leadership here at WSU Vancouver are confident that, upon endorsement, the program's implementation will continue to support the region's need for engineers well into the future.

Sincerely,

Renny Christopher, Ph.D.
Vice Chancellor for Academic Affairs
Washington State University Vancouver

14204 NE Salmon Creek Avenue
Vancouver, WA 98686

EDUCATIONAL SERVICE DISTRICT 112

To the Career Launch Endorsement Review Team:

ESD 112 is excited to support the Engineering Career Launch Project, with partnerships between Clark College and SEH America.

At ESD 112, we recognize the need for

- Private/public partnerships that provide students with career pathways that also provide competitive candidates to meet our business needs
- Meaningful, high-quality on-the-job experience, with defined competencies and skills gained through experience.
- Curriculum developed in partnership with employers and industry, to ensure state-of-the-art curriculum is aligned with occupations in-demand.
- Dedicated wrap-around student support to ensure students have the resources to be successful in academic and non-academic issues.
- Alignment of pathways from K-12 through postsecondary education and career trajectory.
- Career pathways for incumbent workers to upskill for career trajectory.

The Engineering Career Launch Project is an exemplary program, providing students with meaningful, high-quality on-the-job experience that is concurrent with aligned academic curriculum.

On behalf of ESD 112, we commit to working with the Engineering Career Launch Project to make this program successful in the following specific ways:

- Convene and support Career Connect Intermediaries and other local partners in the region through Career Connect SW, our regional network
- Help them achieve their outcomes related to Career Launch endorsement and participation of young people in Career Launch activities
- Ensure equitable inclusion of youth of color, low income youth, youth from rural communities and youth with disabilities.

The impact of this program is vital to meeting our regional workforce needs and we support endorsement of this exemplary program.

Sincerely,

Tim Merlino
Superintendent

workforce
SOUTHWEST WASHINGTON

To the Career Launch Endorsement Review Team:

Workforce Southwest Washington is excited to support the Engineering Career Launch Project, with partnerships between Clark College and SEH America.

At Workforce Southwest Washington, we recognize the need for public-private partnerships that provide students with career pathways that also provide employers with competitive candidates to meet their business needs. Through curriculum developed in partnership with employers and industry, combined with meaningful, high-quality on-the-job experience, the Engineering Career Launch Program is an exemplary proposal that will effectively serve job seekers and industry.

Workforce Southwest Washington invests in human potential and brings together stakeholders from business, economic development, education, labor, government, nonprofit and community organizations in the Clark, Cowlitz, and Wahkiakum counties. WSW convenes these partners to identify the regional workforce needs of specific industries and job seekers.

As a Career Launch Program Intermediary, Workforce Southwest commits to working with the Engineering Career Launch Program to make this program successful in the following specific ways:

- Provide advising for a scaling plan for this program that develops articulation agreements between regional high schools and the Clark College Engineering program;
- Provide strategic guidance for enrolling youth or young adults in the program, with an emphasis on underserved populations (e.g., youth from low income families, youth of color, youth from rural areas, out of school youth, English language learners, youth with disabilities, foster children, homeless youth, single parents, LGBTQIA+ youth, and other populations that face barriers to employment);
- Assist in identifying best practices that could support sustainable and inclusive practices to continuously improve and build sustainability for this partnership; and
- Assist in coordinating distribution of program best practices through Career Connect Washington statewide system for other regions, if applicable.

The impact of this program is vital to meeting our regional workforce needs and we support endorsement of this exemplary program.

Sincerely,

Kevin Perkey

Kevin Perkey
Workforce Southwest Washington – Chief Executive Officer

CAREER CONNECT SOUTHWEST

To the Career Launch Endorsement Review Team:

The Career Connect Southwest Network is excited to support the Engineering Career Launch Project, with partnerships between Clark College and SEH America.

At Career Connect SW, we recognize the need for:

- Private/public partnerships that provide students with career pathways that also provide competitive candidates to meet our business needs
- Meaningful, high-quality on-the-job experience, with defined competencies and skills gained through experience.
- Curriculum developed in partnership with employers and industry, to ensure state-of-the-art curriculum is aligned with occupations in-demand.
- Dedicated wrap-around student support to ensure students have the resources to be successful in academic and non-academic issues.
- Alignment of pathways from K-12 through postsecondary education and career trajectory.
- Career pathways for incumbent workers to upskill for career trajectory.

The Engineering Career Launch Project is an exemplary program, providing students with meaningful, high-quality on-the-job experience that is concurrent with aligned academic curriculum.

On behalf of Career Connect SW, we commit to working with the Engineering Career Launch Project to make this program successful in the following specific ways:

- Support to analyze labor market
- Develop K-16 guided pathway aligned to jobs
- Recruiting and engaging private and public sector organizations
- Raise students' awareness of different career options
- Ensure equitable inclusion of youth of color, low income youth, youth from rural communities and youth with disabilities.

The impact of this program is vital to meeting our regional workforce needs and we support endorsement of this exemplary program.

Sincerely,

V. Hrdina

Vickei Hrdina
Executive Director

P7. Description of resources, supports, or other processes to recruit and support students from underserved backgrounds; or create an implementation plan to do so.

With potential program expansion, the program will intentionally recruit students from underserved backgrounds with specific support from Mathematics, Engineering, Science Achievement (MESA) Program at Clark College. MESA is a program designed to increase the number of historically underrepresented (African American, Native American, Latino/Hispanic, and Pacific Islander/Hawaiian) community college students who transfer to universities and earn STEM (science, technology, engineering, mathematics) bachelor's degrees. This is achieved by providing students with a MESA Study Center in the STEM Building; Textbooks and class supplies; Assistance with STEM classes; Advising and transfer planning; Professional development; and University visits and field trips.

Once students enroll in the program, Clark College offers a variety of supports to assist students from marginalized populations in achieving their educational and professional goals – including the following:

- Appreciative Advising Model that supports students in a holistic manner. All Engineering students are assigned an Engineering Faculty Advisor who assists with academic and non-academic supports throughout their journey at Clark College.
- Workforce Education Services provides a variety of supports to assist low-income students to include, alternative financial aid, access to subsidized childcare, maintenance of public benefits while in school, emergency grants, and assistance in preventing homelessness. Students receive assistance in barrier removal and connections to internal and external resources.
- Disability Support Services (DSS) office assist students with disabilities in pursuing their educational goals. Clark College is committed to assuring that its services, programs, and activities are accessible to individuals with disabilities.
- The Office of Diversity and Equity is committed to serving marginalized populations. The Diversity Center, is a safe space for students to study, meet new people and experience a sense of belonging.
- The Penguin Pantry supports a healthy college community by reducing hunger on campus and connecting students to essential resources.
- Career Services provides a wide array of resources that can assist students with job search skills and securing full-time employment and internships. There are a variety of Student Success Workshops that are offered throughout the academic year to assist students with their professional development, academic success and personal development.

Industry-Related Checklist

I-R1. Address of worksite(s) where Career Launch students will complete supervised training.
SEH America, 11309-11399 NE 39th St, Vancouver, WA 98682

I-R2. Hourly wage for Career Launch participants.
Participants start at $14.50/hour. This usually includes increase pay rates throughout the program as skills advance.

I-R3. List of entry-level positions and associated job descriptions for which a Career Launch student would be eligible for upon completion.
SEH America has confirmed that students who complete the program at Clark College – even if they do not transfer to a four-year institution (WSU-V) – are eligible for full time employment at SEH America.

POSITION TITLE
SUMMARY: Using a hands-on approach, identify opportunities to improve the silicon wafer production process within a high volume manufacturing facility. Primary job function is to monitor and improve safety, quality, yield, productivity, and cost by working with operators, technicians, maintenance, and peers.

JOB DUTIES:
- Implement systems to automate and assist in process monitoring.
- Troubleshoot equipment and process failures and work closely with maintenance and production to resolve the problem.
- Optimize production costs wherever possible.
- Conduct engineering tests. Use data to quantify results and determine best solutions.
- Provide technical expertise and project management with a hands-on approach.
- Use sound judgment when determining priorities and balancing daily process/production support, project related tasks and outside department requests.
- Analyze and interpret information using statistical methods to generate data-driven process improvement actions.
- Lead or participate in root cause analysis or assist with Failure Mode & Effect Analysis (FMEA) as needed to provide recommendations, improvements, and corrective actions.
- Collaborate with other groups to meet specific department and company goals.
- Use lean manufacturing and 5S principles.
- Understand, follow, and maintain detailed procedures and documentation as required by the company. Provide support and feedback to audits by customers, ISO, and internal auditors.

MINIMUM QUALIFICATIONS:
- Bachelor of Science in Engineering (Chemical, Mechanical, Material or similar engineering discipline)
- 3+ years of relevant process or equipment engineering experience in a semiconductor or related manufacturing environment
- Ability to gather, analyze, and interpret process data to make sound decisions
- Experience with statistical data analysis techniques (SPC, Excel tools)
- Ability to work in a fast-pace and data driven environment where multi-tasking is essential
- Proficient at creating clear and concise presentations, reports, and process documentation
- Strong verbal skills to convey technical information to all levels of the company

PREFERRED KNOWLEDGE / SKILLS / EXPERIENCE:
- Experience in a semiconductor or related manufacturing environment
- Project management experience displaying excellence in leadership and meeting deadlines

I-R4. List of specific skills and competencies required for completion of Career Launch program, with demonstrated alignment to entry-level positions, job descriptions, and average local salary ranges.

Specific skills and competencies for the Career Launch program are aligned with the professional standards by ABET: (1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics; (2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors; (3) an ability to communicate effectively with a range of audiences; (4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts; (5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives; (6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions; and (7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Professional Standard	Course Addressing Competency
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	MATH&151-254, 215, 221 CHEM&141-151 PHYS&241-243 ENGR 109, 113, 120, 121, 140, 150, 221, 240, 250, 252, 253, 270 ENGR& 204, 214, 215, 224, 225
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	ENGR& 104, 204, 214, 215, 225 ENGR 252, 253
(3) an ability to communicate effectively with a range of audiences;	ENGL&101 ENGL&235
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	ENGR& 104, 214, 215, 224, and 225
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	ENGR& 104. 109, 120, 204, 214, 215, 221, 224, 225, 240
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	ENGR& 104. 109, 120, 204, 214, 215, 221, 224, 225, 240
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	ENGR& 104. 109, 120, 204, 214, 215, 221, 224, 225, 240

For the aligned positions, the entry-level hourly wage is at or higher than $20.01 for the Southwest Washington counties, and $19.11 for the larger Portland-Vancouver-Hillsboro metropolitan statistical area.

I-R5. Employer attests that Career Launch program is in compliance with required federal, state, and local regulations.

Attestation is included in SEH America Employer Letter (See I-R9, page 15).

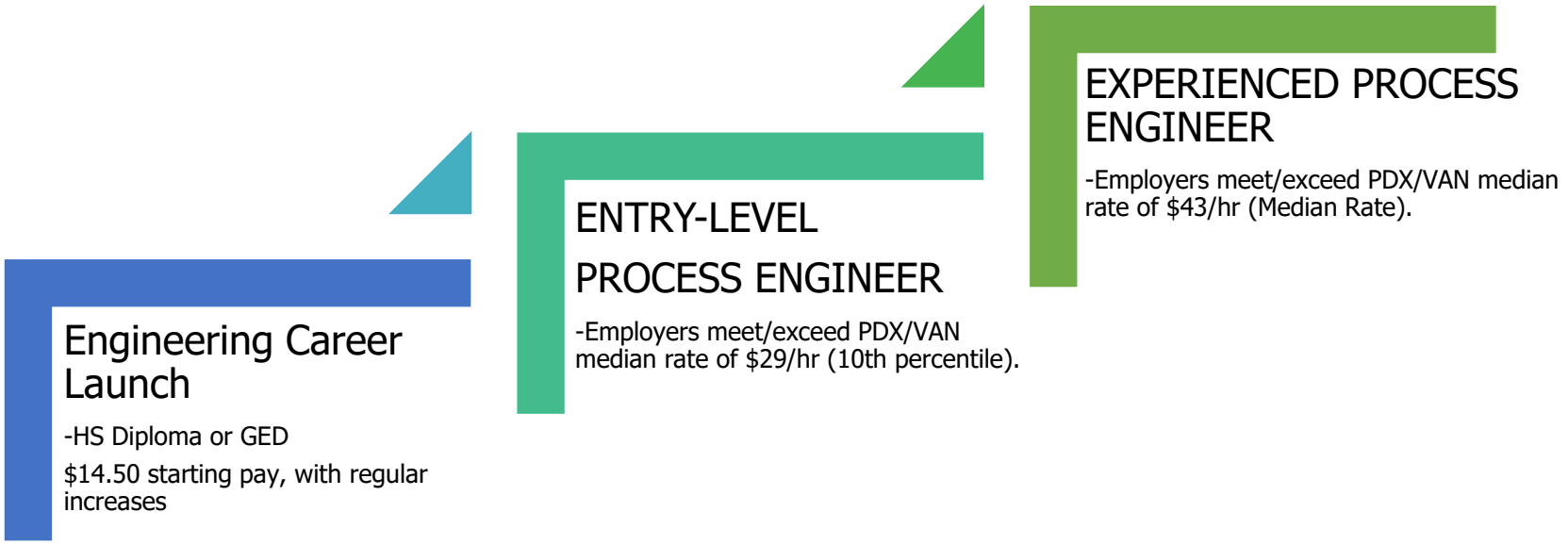
I-R6. Employers will outline a student supervision and mentorship model.

Career Launch participants will have extensive on-the-job training in a three phased approach:

- Phase 1: participants will be placed in a materials management team for 2-6 months where they will learn chemical safety and become familiar with the plant.
- Phase 2: participants will be placed in a production area for 2-6 months to learn more about a specific production process, including tools, workflow, and procedures.
- Phase 3 will last up to 3 years; participants will be placed in an engineering team under the engineering supervisor to support engineering projects. They will bring the skills that they learned during the first 2 phases as well as through school to this position.

Throughout the phases, the participants will be given extensive mentoring and support through engineering staff who have committed to leading tours and trainings throughout the program, their direct supervisors, and through the training and development specialist.

I-R7. Description of common career pathway(s) beginning with entry-level position specified with demonstration of likely salary growth over specified time period.



Students will continue their employment during transfer Washington State University, as Clark College and WSU-Vancouver have an articulation agreement to support student transfer with an Associate of Science – Technology (AST) into the WSU-V Engineering Program.

I-R8. Demonstrated competency alignment with relevant professional standards for specified entry-level positions when applicable.

Professional standards for Engineers is based on the Engineering Accreditation Commission of Accreditation Board for Engineering and Technology (ABET). As detailed in Criterion 3: Student Outcomes, which describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program, including the following:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Students will demonstrate mastery of these categories upon completion of a bachelor's degree in engineering at a four-year institution.

Clark College provides students with the general education requirements, including Pre-Major requirements to successful transfer to a four-year institution with an Engineering Program. This alignment is demonstrated through the articulation agreements and Major Related Program (MRP) within Washington State. Clark has four MRPs: Bioengineering and Chemical Engineering; Computer and Electrical Engineering; Mechanical, Civil, and Aeronautical Engineering; and Computer Science and Engineering. These articulation agreements ensure that students who transfer with the associate degree are prepared to enter with junior-ready status at the four-year institution.

I-R9. Signed letter from employer partner.
Displayed on Page 15.

Shin-Etsu

SEH America, Inc.

4111 N.E. 112th Avenue
Vancouver, WA 98682-6776 USA
P.O. Box 8965, Vancouver, WA 98668-8965
(360) 883-7000 - FAX (360) 254-6973

To the Career Launch Endorsement Review Team:

SEH America is pleased to collaborate with Clark College and its Engineering program for endorsement of the Engineering Career Launch Program. This partnership between Clark College and SEH America provides students with meaningful, high-quality on-the-job experience that is concurrent with aligned academic curriculum.

SEH America manufactures silicon wafers that are the foundation of the electronics industry. Employing over 800 people, access to an educated workforce is key to our success. Like other companies in the region (and other manufacturers in the US), we find it challenging to find employees with the STEM education, skills, and abilities needed to grow our company. We believe that this Engineering Career Launch partnership has and will continue to produce an additional workforce with needed STEM skills and hands-on experiences.

SEH America has a long history of successfully partnering with Clark College, including the Semiconductor & Electronics Manufacturing Technician Career Launch Program.

Within an endorsed program, SEH America commits to partnering in the Engineering Career Launch Program to make this program successful in the following specific ways:

- Compliance with required federal, state, and local regulations for the Engineering Career Launch Program;
- Recruitment of students into the program through community partnerships with K-12, Clark College, and community-based organizations;
- Provide exemplary student supervision and mentorship that allows program participants to gain confidence and skills needed to successfully transition into the workforce;
- Completers of the program will have the knowledge, skills, and abilities preparing them for engineering jobs at SEH A, at a minimum as an engineering intern.
- Consider using the program as an option to skill up our own employees; and
- Provide program participants with the career advancement opportunities, as applicable.

Regional industry needs employees with fundamental engineering competencies. We stand as partner with Clark College to build the best Engineering Career Launch Program that will fully support industry and future workforce needs. This program clearly supports our mission, too. By helping to provide students with the knowledge and exposure to industry needs and an early awareness of technology educational and career pathways, support of this Career Launch program offers SEH America an opportunity to identify high-quality potential graduates with work-ready Engineering technology skills.

We look forward to continuing this partnership with Clark College through the endorsement of the Engineering Career Launch Program.

Sincerely,

Ben Bagherpour
VP of Site Services & Government Affairs, Chair of SW WA High Tech Council

Academic-Related Checklist

A-R1. List of academic institution(s) providing career-aligned instruction for Career Launch.
Clark College & Washington State University-Vancouver

A-R2. Curriculum scope and sequence aligned to skills and competencies provided in employment.
Program outcomes are overarching skills that are emphasized and reinforced throughout several courses in a specific program; they are measurable statements that define what students should know or be able to do by the end of a certificate or degree.

Clark College

- Demonstrate progress toward healthier behaviors. (GE)
- Obtain, evaluate, and ethically use information. (GE)
- Articulate well-considered ideas and written claims to an academic audience, using effective rhetorical techniques, properly credited evidence, and a command of Standard English. (GE)
- Interpret the human experience, within appropriate global and historical contexts, through evaluation, analysis, creation, or performance. (GE)
- Evaluate, analyze, and explain events, behaviors, and institutions using perspectives and methods in the Social Sciences. (GE)
- Analyze patterns of power, privilege, and inequity in the United States. (GE)
- Analyze and interpret quantitative information presented verbally, graphically, numerically, and/or symbolically. (GE)
- Apply communication theory to demonstrate effective oral communication skills.(GE)
- Demonstrate and clearly explain an effective strategy to solve a quantitative problem. (GE)
- Demonstrate understanding of the derivative as an instantaneous rate of change and the definite integral as a limit of a sum.
- Apply fundamental principles and relationships from the Natural Sciences to analyze technological or scientific problems.
- Apply scientific and technological knowledge and methodologies to creatively solve technological or scientific problems.
- Acquire scientific and technological information from appropriate sources to examine issues, claims or situations.
- Analyze and solve multi-step problems using techniques through single-variable calculus.

Washington State University-Vancouver

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- An ability to communicate effectively with a range of audiences.
- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

CLARK: Associate of Science – Transfer (AST) MRP OTRE Engineering Course Sequence

Communication Skills		
ENGL& 101	English Composition I	5
Humanities/Fine Arts/English & Social Science		
Minimum 5 credits in Humanities, minimum 5 credits in Social Science, plus an additional 5 credits in either Humanities or Social Science		15
Mathematics		
MATH& 151	Calculus I	5
MATH& 152	Calculus II	5
MATH& 153	Calculus III	5
MATH 215	Linear Algebra	5
MATH 221	Differential Equations [2]	5
Physics		
Complete the following with the required concurrent enrollment: [3]		15
Sequence One		
PHYS& 241 & PHYS 94	Engineering Physics I and Physics Calculations (concurrent enrollment required)	4
PHYS& 231	Engineering Phys Lab I	1
Sequence Two		
PHYS& 242 & PHYS 95	Engineering Physics II and Physics Calculations (concurrent enrollment required)	4
PHYS& 232	Engineering Phys Lab II	1
Sequence Three		
PHYS& 243 & PHYS 96	Engineering Physics III and Physics Calculations (concurrent enrollment required)	4
PHYS& 233	Engineering Phys Lab III	1
Chemistry with Laboratory		
CHEM& 141 & CHEM& 151	General Chemistry I and General Chemistry Laboratory I	4
CHEM& 142 & CHEM& 152	General Chemistry II and General Chemistry Laboratory II	4
Additional Requirements		
ENGR& 214	Statics	5
ENGR& 215	Dynamics	5
ENGR& 225	Mechanics Of Materials	5
Electives		
Electives as appropriate for intended major and intended baccalaureate institution. Requirements vary by school and program.		***15-20***
Computer Programming		
Innovation in Design		
Calculus IV (Advanced or Multi-Variable Calculus)		
3-D Visualization and CAD (Engineering Graphics)		
Technical Writing		
Thermodynamics		
Electrical Circuits		
Materials Science		
Applied Numerical Methods		
Total Credits/Units		**102**

WSU Vancouver
School of Engineering & Computer Science
BS in Mechanical Engineering – Schedule of Study

	Fall Freshman	Credits		Spring Freshman	Credits
	*Chem 105 [PSCI] Chem I	4		Chem 106 [PSCI] Chem II	4
	History 105 [ROOT]	3		Engl 101 [WRTG] Intro Writ.	3
	Humanities [HUM]	3		*Math 172 Calculus II	4
	*Math 171 [QUAN] Calculus I	4		MECH 103 Engr. Graphics	2
	MECH 101 Intro to ME	2			
		16			13

	Fall Sophomore	Credits		Spring Sophomore	Credits
	EconS 101 or 102 [SSCI]	3		Bio. Sciences [BSCI]	3
	*Math 220 Linear Algebra	2		*Math 315 Diff. Equations	3
	*Math 273 Calculus III	2		*MECH 212 Dynamics	3
	*MECH 211 Statics	3		*MECH 215 Mech. Of Mater.	3
	MECH 251 Numerical Comp.	2		Phys 202 [PSCI] Engr. Phys. II	4
	*Phys 201 [PSCI] Engr. Phys. I	4			
		16			16

☐ Complete Junior Writing Portfolio (60 credits)

☐ DI·ʎy I·ŘYʎăăʎ2y ű2 Y I·ʔ2Ǌ[1]

	Fall Junior	Credits		Spring Junior	Credits
	Engl 402 [WRTG] Tech/Prof Writ.	3		MECH 310 Intro Des. & Manuf.	4
	MECH 301 Thermodynamics	3		MECH 314 Machine Design I	3
	MECH 303 Fluid Mechanics	3		MECH 348 Dynamic Systems	3
	MECH 304 Instrum. & Measure.	3		MECH 404 Heat Transfer	3
	MECH 309 [M] Intro Engr. Mater.	3		MECH Option Course I	3
		15			16

☐ Submit Graduation Application (myWSU)

	Fall Senior	Credits		Spring Senior	Credits
	MECH 416 [M] Mech Syst. Des. I	2		Creative & Prof. Arts [ARTS]	3
	MECH 414 Machine Design II	3		Diversity [DIVR]	3
	MECH 402 Thermal Syst. Design	3		MECH 417 [CAPS] Mech Syst. Des. II	3
	MECH Tech Elective	3		MECH Tech Elective	3
	MECH Option Course II	3		MECH Option Course III	3
		14			15

a9CH Requirements effective Fall 2020
Rev. 2/20

Footnotes

[1] Transfer students are admitted to the MECH major after meeting these requirements:

1. Completing the following courses with a grade of C or better: CHEM 105, MATH 171, MATH 172, MATH 220, MATH 273, MATH 315, MECH 211, MECH 212, MECH 215, and PHYS 201
2. Earning a cumulative GPA of 2.5 or higher at previous institution, and making their intention known to their WSU advisor
3. To remain in the major the student must maintain a 2.0 GPA each term as well as a 2.0 or higher CS GPA.

All students should work closely with an Academic Coordinator to ensure courses are taken in the proper order.

A-R3. Demonstration of student supports (e.g. mentoring, advising, financial aid, tutoring) available for Career Launch students enrolled in the course.

There are a number of supports available to Career Launch students to assist them in achieving academic success at Clark College:

- Clark College has implemented the Appreciative Advising Model that supports students in a holistic manner. This is an intentional collaborative practice of asking positive, open-ended questions that help students optimize their education experiences and achieve their dreams, goals, and potentials. All Engineering students are assigned an Engineering Faculty Advisor who assists with academic and non-academic supports throughout their journey at Clark College.
- Peer Mentors Clark College Peer Mentor Programs provide an opportunity for students to help others connect to Clark College and community resources, navigate the college, and work toward academic goals.
- Student Success Programs offers a variety of supports to students to include: strategies for balancing classes, work and personal responsibilities, access to college and community resources, assistance with developing and achieving academic goals, and one-on-one support from the Clark College Student Success Coach.
- Tutoring Services is designed to provide individualized attention that facilitates student learning and academic success. Tutors will help students develop skills and confidence to become a stronger, more independent learner. Students who come in for tutoring may also access computers, software, handouts, reference materials, and other resources.
- Financial Aid is available to provide students with a variety of funding supports to help cover the cost of education expenses to include tuition, fees, books and supplies. The Financial Aid Office is available to assist students in understanding financial aid options, to include student loans, grants, work study and scholarships.

A-R4. Number of postsecondary credits provided and / or credential earned upon completion of program.

Upon completion of the Associate of Science - Transfer (AST) degree, students will have earned a postsecondary credential, which serve as the first two years of general education coursework to enter the Engineering Program at a four-year institution. The AST degree is a minimum of 90 postsecondary credits.

A-R5. Demonstrated curricular alignment with relevant professional and / or academic standards associated with coursework and credential, when applicable.

Upon completion of the Associate of Science - Transfer (AST) degree, students will have completed 30 credits of General Education Requirements, as required by accreditation through the Northwest Commission on Colleges and Universities (NWCCU):

- 5 credits of Communications,
- 10 credits of Quantitative Skills/Symbolic Reasoning Skills, and
- 15 credits of Humanities & Social Sciences.

In addition, students complete a minimum of 25 Major Engineering Credits and 32 Major Elective Credits.

A-R6. Details of potential for current or future partnerships and/or scalability of the program within and across sectors and/or geographic locations (e.g. articulation, degree pathways), when applicable.

Once endorsed, this program plans to expand capacity with additional employer partnerships – particularly if expanded capacity (e.g., space and resources) were available.

Clark College is willing share lessons learned and partnership structure to other community colleges in the state interested in offering this program.