SVC | Skagit Valley College

STATE BOARD FOR COMMUNITY AND TECHNICAL COLLEGES
MAY 2022
PROGRAM PROPOSAL
BACHELOR OF APPLIED SCIENCE
PRODUCT DEVELOPMENT

SKAGIT VALLEY COLLEGE

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Program Information

Institution Name: Skagit Valley College

Degree Name: Product Development

    CIP Code: 15.0613

Name(s) of existing technical associate degree(s) that will serve as the foundation for this program:

    Degree: Manufacturing Technology AAS

        CIP Code: 15.0613

        Year Began: 2011

    Degree: Engineering Technology AAS/AAST

        CIP Code: 15.0613

        Year Began: 2014/2018

    Degree: Operations Management AAS/AAST

        CIP Code: 52.0205

        Year Began: 2014/2018

    Degree: Welding Technology AAS

        CIP Code: 48.0508

        Year Began: 1964

    Degree: Automotive Technology AAS

        CIP Code: 47.0604

        Year Began: 1964

    Degree: Business Management AAS

        CIP Code: 52.1401

        Year Began: 1985

Proposed Start Implementation Date (i.e. Fall 2014): Fall 2023

Projected Enrollment (FTE) in Year One: 12

Projected Enrollment (FTE) by Year: 2025

Funding Source: State FTE

Mode of Delivery

Single Campus Delivery: Skagit Valley College, Mount Vernon Campus

Off-site: Click or tap here to enter text.

Distance Learning: Click or tap here to enter text.

Program Proposal

Please see criteria and standard sheet. **Page Limit: 30 pages**

Contact Information (Academic Department Representative)

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Chief Academic Officer signature

The Program Proposal must be signed. To sign, double click on the signature line below.

_____

Chief Academic Officer

4/14/2022

Criteria 1
Curriculum demonstrates baccalaureate level rigor.

Skagit Valley College is proposing a Bachelors of Applied Science in Product Development (BAS PD). Product development includes a combination of the artistic design and development of manufactured products, research on product use and materials, and the evaluation of production processes, including quality control, inventory control, logistics and material flow, cost analysis, and production coordination. Graduates of the proposed program will be trained to work as leaders or managers in manufacturing and production environments.

The proposed BAS PD program is part of a multi-year project focusing on significant curricular and facilities redesign of the existing Skagit Valley College manufacturing, composites, and technical design offerings into one streamlined pathway that will include a one-year certificate, an associate's degree and a bachelor's of applied science. This educational pathway will provide stacked certificate, associates, and bachelor's degree options with intermittent "off-ramps" where student can enter the workforce with their credential and the relevant skills sets while concurrently creating "on-ramps" where students can return to school to continue their education.

Program Learning Outcomes

Graduates from the Bachelor's program in Product Development are employed as manufacturing technicians, product development team members and prototype technicians with abilities to:

1. Employ a product design and development process to create a plan that will take a product idea from concept to production.
2. Demonstrate teamwork, leadership, professionalism, and the ability to communicate requirements, ideas, and concepts critical to success. (*Revised per SBCTC Review*)
3. Analyze industrial standard literature as it applies to testing and validation of a product design.
4. Implement various strategies for concept testing of a new product prototype in an industrial environment.
5. Investigate the way in which personal integrity shapes individual approaches to ethical dilemmas. (*NEW- added post external evaluation*)
6. Develop and implement a new or improved production line in support of a new or improved manufactured product.

Program Evaluation Criteria and Process

Skagit Valley College is committed to the educational, personal, and economic success of students and promotes equitable and thriving communities. Program Review assesses and provides data to determine if programs are fulfilling their commitment to students. It is a tool for faculty to make informed, data-driven decisions to meet the needs of disciplines, students, and the community. Skagit Valley College Program Review is a four-year process that includes three years of program data collection followed by a fourth year of data analysis and planning. The purpose of the annual review is to give faculty the opportunity to evaluate the effectiveness of their program through an equity lens and to adjust the structure, pedagogy, curriculum, and institutional support of the program as needed. This process informs the college's operational planning and is used in the prioritization of effort and resource allocation. This Bachelors Program Review process collects, analyzes, and measures data annually on the following categories:

- Student Access
  - Enrollment
  - Demographics
- Student Achievement
  - Retention

- o Completion
- Student Learning
  - o Course level learning outcomes
  - o Program level learning outcomes
- Student Satisfaction
  - o Noel Levitz student survey
  - o Program specific student surveys

Course Preparation
Entry requirements

Any professional technical associate's degree in industrial trades, manufacturing or engineering, including the following courses:
- English 101- English Composition, or equivalent (5 credits)
- Math 146- Introduction to Statistics, or equivalent (5 credits)
- Communications Studies 210- Interpersonal Communications or 220- Public Speaking, or equivalent (5 credits)
- Lab-based natural science (5 credits)
- Computer-Aided Design (10 credits or equivalent industry experience)

Currently Skagit Valley College has several programs being offered, that align with the Industrial Technology Area of Study and will directly articulate into the BAS-Product Development:
- Manufacturing Technology AAS
- Engineering Technology AAS/ AAS-T
- Operations Management AAS/ AAS-T
- Welding Technology AAS
- Automotive Technology AAS
- Business Management AAS (*requires a technical bridge*)

General Education
The proposed BAS PD degree will provide students with the needed knowledge and skills in general education as well as an applied emphasis on the artistic design and development of manufactured products. The curriculum contains applied, general education courses specifically geared towards students in the manufacturing and production field. A capstone practicum is also required to provide practical knowledge and hands-on experience in the field. Students graduating with a BAS PD degree at Skagit Valley College will complete a minimum of 60 general education credits in distribution areas that include the social sciences, humanities, communications, natural sciences, and quantitative studies.

Consistent with new state guidance, students will have met the general education requirements (basic and distribution areas) for an applied baccalaureate degree from a Washington State community or technical college if they have earned a baccalaureate degree from an institution accredited by one of the following agencies:
- Accrediting Commission for Community and Junior Colleges, Western Association of Schools and Colleges (ACCJC)
- Higher Learning Commission (HLC)
- Middle States Commission on Secondary Schools (MSA-CESS)
- Northwest Commission on Colleges and Universities (NWCCU)
- Southern Association of Colleges and Schools Commission on Colleges (SACSCOC)
- Middle States Commission on Higher Education (MSCHE)

- New England Commission of Higher Education (NECHE)
- WASC Senior College and University Commission (WSCUC)

Students must still complete program-specific general education degree requirements if not otherwise satisfied.

1. Basic Requirements (15 credits)
   a. Communication Skills
      i. ENGL& 101 (5 cr)
      ii. CMST& 210 or 220 (5 cr)
   b. Quantitative/Symbolic Reasoning Skills
      i. MATH& 146 (5 cr)

2. Distribution requirements (30 credits)
   a. Humanities (10 credits)
      i. CMST 3xx Design presentation (5cr)
      ii. PHIL 4xx Ethical/Economical product dev. (5cr)
   b. Social Sciences (10 credits)
      i. Econ 3xx Economics of Product Development (5 cr)
      ii. BUS 4xx Entrepreneurship and Innovation (5cr)
   c. Natural Sciences (10 credits)
      i. Strongly recommend lab-based Physics (*Based on external evaluator recommendation*)

3. Additional general education courses (15 credits)
   d. ART 3xx Industrial Design CAD Skills with CAM (5cr)
   e. ART 3xx Industrial Design Application (7cr)
   f. BUS 4xx Supply Chain Management (5cr)

In addition to general education courses, students will also be exposed to general education outcomes embedded throughout the program.
- ART 3xx (5cr)   Industrial Design CAD Skills with CAM
- ART 3xx (7cr)   Industrial Design Application
- ECON 3xx (5cr) Economics of Product Development
- CMST 3xx (5cr) Design presentation
- BUS 4xx (5cr)   Supply Chain Management
- BUS 4xx (5cr)   Entrepreneurship and Innovation
- PHIL 4xx (5cr) Ethical/Economical product dev.
- ENGR 3xx (5cr) Materials for Design

Junior & Senior Level Coursework

The proposed BAS PD curriculum gives students a solid and practical foundation of the artistic design and development of manufactured products. With a focus on immediate application of knowledge and skills in the production lab. Students will learn to research product use and materials as well as evaluate production processes including quality control, inventory control, logistics and material flow, cost analysis, and production coordination. The curriculum will also integrate concepts of communication, professionalism, and social justice concepts to equip students with the acumen, skills, awareness, and knowledge necessary for equitable and meaningful workplace participation. These concepts will be embedded and assessed in each course in the program so that students get the opportunity to practice and refine their capabilities and skills in a performance context, please

At initial implementation, all courses will be required core courses and there will be no elective options.

The program has been designed and integrated in a way that requires students to complete each quarter sequentially. In other words, each quarter is a pre-requisite to the next. Skagit Valley College will also emphasize building the student cohort in the first quarter of the program so, in addition to the support resources provided by the college, students form a peer network for support and empowerment.

Course Descriptions

ART 3xx (5cr) Industrial Design CAD Skills with CAM
This course develops a student's understanding and practice of the techniques for producing digital interpretations of designs. The techniques covered include various modeling techniques with presentation as the deliverable. The course culminates with the presentation of a design concept for faculty review.

ART 3xx (5cr) Industrial Design Application
Using a team approach, this class emphasizes a comprehensive design process including market research, iterative ideation, virtual prototyping and design implementation. Through the design of various products, students develop problem solving skills throughout the design process.

BASAM 322 (5cr) Project Management
Examine the importance of project management as a key managerial competency and investigate the ways in which key project management concepts and tools integrate into an operational model. Analyze the connections between project management and other management functions and define the characteristics of effective project management and managers. Investigate the ways in which bias can impact effective project management and develop mitigating solutions.

BASAM 330 (5cr) Operations Management
Explore and apply the concepts, principles, problems, and practices of operations management in different sizes and types of goods producing and service organizations. Topics include operations strategy, process design, capacity planning, facilities location and design, forecasting, scheduling, quality assurance, continual improvement and operational effectiveness, environmentally sustainable practices, and inventory management.

BUS 4xx (5cr) Supply Chain Management
This course examines the principles, techniques, and practices for the design and management of integrated supply chain operations. Participants investigate supply chain strategy, distribution, facility location decisions and purchasing as applied to the information systems used in the management of the Skagit Valley College Production Lab and the development of products for the Lab.

BUS 4xx (5cr) Entrepreneurship and Innovation
This course puts the foundations, theory, and process of innovation knowledge into practice. Students apply their skills and capabilities within the context of an existing organizational structure to launch a product into production.

CMST 3xx (5cr) Design Presentation
Within the context developing a design presentation package, this course provides an overview of communication processes involved in marketing interactions and collaborative decision making

related to generating proposals and presenting a completed design concept. It focuses on applications of decision making, problem solving and presentation skills.

ECON 3xx (5cr) Economics of Product Development
This application of micro- and macroeconomic theory explores the relationship between new product development and a company's economic system. Topics include economic systems, the influence of governments on the economy, market structures and competition, resource allocation, production, pricing, consumer choice, and externalities. Students us both qualitative and quantitative analysis to inform design decisions.

ENGR 3xx (5cr) Materials for Design
This course explores the fundamentals of materials technology for product development, including how the structure and properties of materials influence the selection of primary materials. Students apply the acquired materials knowledge to the current design project (ART 3XX).

PHIL 4xx (5cr) Ethical/Economical Product Development
An examination of the role of ethics and social responsibility in business. Theoretical concepts in business ethics will be applied to challenges faced in the development of ethical products and processes. The course emphasizes person integrity, contemporary trends, and corporate responsibilities with respect to legal, economic, and regulatory conditions while still addressing the needs of stakeholders in the marketplace.

MANF 3xx (5cr) Production Tooling and Automation
Students will apply practical manufacturing techniques to theoretical challenges. Concurrent with Art 3xx and ENGR 3xx, students design tooling, fixtures, and automation solutions for design challenges. The resulting designs incorporate conceptual exploration with the practical demands of the Skagit Valley College Production Lab.

MANF 37x (5cr) Product Validation
Through research of the applicable standards, students define the functional parameters of a specific design. The prototypes developed in MANF 36x will be benchmarked against competitive designs. The scope of production will be explored through forecasting. Develop control models from the final product design, to be utilized by the production team.

MANF 4xx (3cr) Prototyping
In conjunction with MANF 37x, students explore and implement several iterations of the product design to confirm functionality, customer satisfaction and manufacturability. Students start with feasibility studies, move to visual and functional prototypes. The culminating project runs the alpha prototype through the Product Validation process.

MANF 4xx (7cr) Practical Design Applications
This studio course work focuses on entrepreneurialism. Students identify the business aspects of industrial design and apply these principles to their design projects. Initiating the process of realizing their finalized design, students begin to develop the processes and infrastructure to progress into full production.

MANF 4xx (3cr) Contracts and Vendor Relations
In this course, students participate in vendor screening and selection. The course applies sound supply chain principles to the validation of vendor relations and ultimately to the final negotiations of contracts with manufacturing suppliers.

MANF 4xx (7cr) First Article Inspection and Process Control
Participants capitalize on lessons learned through the design validation process to design robust inspection protocols for production. Through the First Article Inspection process, product design/production process compatibility is validated. Inspection process documents are developed to ensure consistent product quality.

MANF 4xx (3cr) Enterprise Resource Planning
This course utilizes the systems and planning tools used in manufacturing. Students develop and deploy a product program within an enterprise resource planning (ERP) while applying practical applications of material requirement planning (MRP), and aggregate planning.

MANF 4xx (7cr) Manufacturing Practicum
In this course, students capitalize on the previous two years' experience to realize the product design. The program culminates with a full-scale product launch of finalized design, employing first year Production Lab students as the manufacturing staff. As a final measure, participants capture the process in an oral presentation and capture lessons learned in a formal document for future review.

Course Sequence
Years 1-2
- Associates Degree (90 credits)

Year 3
Quarter 1 (15 credits)
- ART 3xx- Industrial Design CAD Skills with CAM (5 credits)
- ENGR 3xx- Materials for Design (5 credits)
- MANF 3xx- Production Tooling and Automation (5 credits)

Quarter 2 (15 credits)
- ART 3xx- Industrial Design Application (5 credits)
- ECON 3xx- Economics of Product Development (5 credits)
- BASAM 322- Project Management (5 credits)

Quarter 3 (15 credits)
- CMST 3xx- Design Presentation (5 credits)
- BASAM 330- Operations Management (5cr)
- MANF 3xx- Product Validation (5 credits)

Year 4
Quarter 4 (15 credits)
- BUS 4xx- Supply Chain Management (5 credits)
- MANF 4xx- Prototyping (3 credits)
- MANF 4xx- Practical Design Applications (7 credits)

Quarter 5 (15 credits)
- PHIL 4xx- Ethical/Economical Product Development (5 credits)
- MANF 4xx- Contracts and Vendor Relations (3 credits)
- MANF 4xx- First Article Inspection and Process Control (7 credits)

Quarter 6 (15 credits)
- BUS 4xx- Entrepreneurship and Innovation (5 credits)

- MANF 4xx- Enterprise Resource Planning (3 credits)
- MANF 4xx- Manufacturing Practicum (7 credits)

Criteria 2
Qualified faculty.

Skagit Valley College will be hiring one full-time position to start the program and add instructional capacity as needed in subsequent years through associate faculty and additional full-time positions. This full-time position will be hired approximately three to six months prior to program launch to finalize curriculum, establish industry connections, recruit students, and teach courses once the program begins. The ideal candidate will have the appropriate combination of education and industry experience to both lead the vision for the department as well as teach in the classroom. Consistent with the Skagit Valley College Faculty Collective Bargaining agreement, beyond teaching, this position is responsible for the management of resources used by the program including planning, purchasing, and maintaining software and supplies. Consistent with the Skagit Valley College Faculty Collective Bargaining agreement, this position will also be responsible for developing course schedules, syllabi, assessing student outcomes, building curriculum, seeking additional resources for the department, and establishing innovative partnerships with industry to ensure that graduates have both the practical and soft skills to thrive in the tech market. The preferred level of education will be a doctorate in a related field, with a minimum requirement of a Master's degree. This is an effort to maintain access to a deep and diverse pool of applicants.

Per the Skagit Valley College Faculty Negotiated Agreement, a full-time faculty contract is for 35 hours per week and 172 days per academic year. A full-time faculty teaching load is 45 Faculty Credit Units which equates to approximately three courses per quarter. Beyond teaching, full-time faculty expectations also include advising and participation in college meetings and shared governance committees.

Product Development Faculty Job Description
Duties & Responsibilities
- Lead the Bachelors of Applied Science in Product Development program (BAS-PD), developing innovative programming, curricula, and inclusive pedagogy that address program learning outcomes.
- Conduct program outreach by leading program briefing sessions for prospective students, assisting with marketing and recruitment activities and leading student application reviews.
- Initiate new interagency agreements and develop partnerships with regional agencies for student projects, resource sharing, and collaboration.
- Provide select classroom and/or online instruction in the Product Development BAS program.
- Advise and mentor BAS-PD students including those from underrepresented and underserved groups.
- Assist students in locating internships and job placements.
- Conduct ongoing development, assessment, and revision of curriculum that incorporates innovative and inclusive pedagogy and advances in the field of Product Development.
- Identify and pursue grants and other resources for the program to maintain industry standards.
- Recruit, screen, hire, and train part-time, associate faculty teaching in the program.
- Create a positive learning environment for students using diverse teaching methods to support and enhance student success.
- Collaborate with faculty from other disciplines to develop and offer integrative learning experiences to support SVC BAS programs.

- Collaborate with other disciplines increase enrollment and support student retention in the program with a focus on ameliorating equity gaps.
- Engage in activities that complement and inform teaching and disciplinary excellence.
- Participate in department and other college activities, including college governance.
- Fulfill full-time faculty responsibilities in accordance with the negotiated agreement and Skagit Valley College policies.
- Perform other related duties and special projects as assigned.

Knowledge, Skills, and Abilities
Knowledge or understanding of:
- New product development.
- Supply chain management.
- Economics of product development and production.
- Materials applied to product design.
- Vendor management.
- Production supervision.

Skills in:
- CAD and CAM.
- 3 and 5 axis CNC programming and operation.
- Measurement and inspection (GD&T)
- Product design validation.
- Materials applied to product design.

Ability to:
- Build a baccalaureate-level Product Development program that meets the needs of the college's students and the community.
- Maintain partnerships and interagency community connections and connect with regional employers and industry stakeholders.
- Demonstrate commitment to equity-minded approaches to teaching and learning for all students.
- Engage students through innovative instructional approaches such as community-based projects, and contextualized learning.
- Adapt to a variety of teaching situations, including interdisciplinary learning communities, and online and hybrid modalities.
- Support students in accessing appropriate instructional and non-instructional services to facilitate student retention, completion, and academic success for all students.
- Express appropriate awareness of the history of underrepresented groups to promote an equitable work and learning environment.
- Recruit and inspire diverse student populations to embrace learning and facilitate completion.
- Work and interact effectively with colleagues, staff, students, administrators, and other various cultural and socio-economic backgrounds in support of SVC's commitment to equity, diversity, and inclusion.
- Act according to principles of integrity, respect, open and honest communication, collaboration, and compassion.

Minimum Qualifications
- Master's degree in Engineering, Industrial Design or a closely related field.
- 5 years of industry experience in manufacturing and product development.

- Able to successfully work in virtual and hybrid teaching environment
- Teaching experience in education or industry.
- Equivalent combination of education, training, and industry experience totaling 7 years.

OR

- Equivalent combination of education, training, and field experience totaling seven (7) years.

Desired Qualifications
- Doctorate in Engineering, Industrial Design or a closely related field.
- Higher education teaching experience, especially in a community and technical college setting.
- Senior-level industry experience in engineering or product development.
- Ten (10) years of engineering or product development experience including five (5) years of project management.

Current Faculty
The following current Skagit Valley College faculty will contribute to the program:
- Bruce Poole (MS)- Full-time Faculty/ Department Chair, Manufacturing
- Mary Iverson (MFA)- Tenured Faculty/ Department Chair, Art
- Sunaina Virendra (MEd, MBA)- Tenured faculty/BAS Director, Bachelors in Applied Management
- Farhana Loonat (PhD) Tenured Faculty/ Department Chair, Philosophy
- Jason Lind (MA)- Tenured Faculty, Communication Studies
- Matt Scammell (MBA)- Tenured Faculty, Economics

Skagit Valley College will complement these faculty with appropriately qualified associate instructors and lab technicians. The college will also recruit a cadre of guest speakers from a variety of advanced manufacturing and engineering backgrounds. Total starting full-time equivalent faculty for the proposed Product Development program: 1.6 FTEs.

Criteria 3
Selective admissions process, if used for the program, consistent with an open-door institution.
Skagit Valley College utilizes shared outreach, marketing, and admissions processes across all applied baccalaureate programs. While each program may individualize their target audience, messaging, and entry requirements, all bachelor's level programs use a common framework and workflow.

Outreach and Recruitment
Outreach and recruitment is a collaborative effort between the Skagit Valley College Enrollment Services department and program faculty, and applied bachelor's degree information is available in all print and online college materials. There is a tab on Skagit Valley College Home Page that highlights Applied Bachelors offerings. Additionally, each applied bachelors program has a dedicated webpage, which complement the common associate degree pages but cover *Frequently Asked Questions* about applied bachelor's degrees, selective admission application requirements, upper division course expectations and program briefing session requirements.

Students interested in the proposed bachelors program will be required to attend a faculty-run program briefing. Topics covered in the program briefing include: entry requirements, the admission

process, costs, curriculum and application deadlines and services available to students accepted into the program. Briefings are offered at least monthly and typically take place online and in person.

Entry requirements

Any professional technical associate's degree in industrial trades, manufacturing, or engineering, including the following courses:

- English 101- English Composition, or equivalent (5 credits)
- Math 146- Introduction to Statistics, or equivalent (5 credits)
- Communications Studies 210- Interpersonal Communications or 220- Public Speaking, or equivalent (5 credits)
- Lab-based natural science (5 credits)
- Computer-Aided Design (10 credits or equivalent industry experience)

Currently Skagit Valley College has several programs being offered, that align with the Industrial Technology Area of Study and will directly articulate into the proposed applied bachelors in Product Development:

- Manufacturing Technology AAS
- Engineering Technology AAS/ AAS-T
- Operations Management AAS/ AAS-T
- Welding Technology AAS
- Automotive Technology AAS
- Business Management AAS (*requires a technical bridge*)

Business Management AAS students will be advised into an individualized technical bridge based on their prior courses and experience. Students graduating from other community colleges with an associate's degree (AAS-T, AAS, ATA, AA, AS) in an industrial trades-related field will be encouraged to apply. Most community and technical colleges in the Washington State system offer two-year degrees in these areas, so Skagit Valley College will collaborate with all interested institutions in developing articulations agreements, but primary partners in the Northwest region will be Bellingham Technical College and Everett Community College to establish clear pathways for engineering, manufacturing, and trades students to enter the proposed Product Development program. To facilitate student articulation, Skagit Valley College will provide peer institutions clear guidelines for core course requirements for entry into the proposed Product Development program. This will ensure that students who wish to transfer are well prepared, and they can transfer without delay due to additional course requirements. For students that do not have the appropriate college-level math, Skagit Valley College offers Math& 146 with Math 046 as an IBEST option to ensure students meet MATH& 146 outcomes in one academic quarter.

Admissions Process

Skagit Valley College has standardized the admissions process across bachelors-level programs to ensure all applied bachelor's students are academically prepared to be successful at the baccalaureate level. The standard admissions process has been intentionally designed to encourage access and eliminate barriers to program entry, while accounting for academic preparation and space available. The standardized admissions process and the cohort program model, which represent a partnership between Student Services and Instruction, streamline transactional student support activities and mean that resources are channeled on relational advising in support of student achievement and completion Bachelors admissions at Skagit Valley College will be selective entry, all programs will follow a common timeline and have a standard application. However, individual program pre-requisite degrees and courses will be determined by each program as appropriate.

1. Admission date is a Fall Quarter start due to course sequencing requirements and the importance of building the cohort.
2. Applications are due in early March with applications arriving after the deadline considered on a space available basis, there is no fee to apply. Students are notified of acceptance in March to allow for at least two quarters for program pre-requisites and technical bridge completion.
3. Prospective bachelor's students must have a minimum of 90 credits (or an associate's degree) with a minimum cumulative GPA of 2.50. Applicants will submit:
    a. Official transcript
    b. State application (if not already Skagit Valley College student)
    c. Program application (Online Target X form), which includes a personal statement that asks applicants to share their experiences with independent learning and to describe their professional and career goals.
4. Applications will be reviewed to ensure that minimum requirements and prerequisites have been met, requests will be sent for any missing information.
5. Complete applications will be reviewed and selected by the Program Admissions Committee.

When applications exceed the number of spots available in the program, student applications will be scored using a standard rubric. The rubric is based on the following steps: determining eligibility; assessing academic readiness; assessing motivation through a review of the personal statement; and then prioritizing selection. Final selection will be based on space in the program and the applicant's score. All applicants who met the March priority deadline will be notified of their status at the same time. Program faculty will approve applications for admissions with consult with Program Admissions Committee and Instructional Dean on cases where there is question whether or not minimum requirements were met. Students selected to participate will be provided with next steps.

All accepted students attend a mandatory program onboarding held in early September. At the onboarding, program faculty review the course of study and describe the available instructional and student service supports. Applicants not selected will be placed on the program waiting list, managed by the Product Development faculty. The program faculty will work with waitlisted students and their advisers to support them with an application to the next program.

Equity in Access
Skagit Valley College will make a concerted effort to assure that the proposed Product Development program serves a diverse population of students. Grounded in equity, the vision statement for Skagit Valley College commits to equity and one way this is measured is through core themes for "Equity in Access" and "Equity in Achievement" both of which set a target of student body composition mirroring the demographics of Skagit's service area. To support equity and social justice, an Associate Vice President of Equity and Inclusion has been established, and plans for increasing enrollment, engagement, and achievement of Latinx students have been created and funded. Additionally, the college has created the Office of Multicultural Student Services with a full-time director, with the specific mission to create programming and opportunities for student, faculty, and staff engagement and conversations around equity and diversity. The college is focusing on recruitment and retention from area high schools with high percentages of Latinx students. Skagit Valley College Enrollment Services, Financial Aid, and Advising offices include bilingual staff to answer questions and service and support the Latinx population. The college district also has five Native American tribes within its region. The President is personally establishing relationships with each tribal government and beginning to build plans for increasing the number of Native American students in college programs.

Many of the potential Product Development students are place bound and have little or no opportunity for attending a four-year university. Rural students graduating from high school who are place bound for economic or social reasons will be afforded an opportunity for a baccalaureate degree. Since many students will come from the Skagit Valley College service district, it is important to note the diversity of the three-county area. The Skagit service district is diverse, and the College actively recruits at local high schools that include significant numbers of students of color. These include Mount Vernon High School (52% Latinx), Burlington-Edison High School (33% Latinx), Sedro-Woolley High School (16% Latinx), and Oak Harbor High School (13% Latinx). The Latinx population is even higher in lower grades, indicating that the number of Latinx students in the high schools will continue to increase, and, therefore, the number of Latinx students at Skagit Valley College will increase.

Criteria 4
Appropriate student services plan.

Skagit Valley College's Guiding Principles, Core Themes, and Objectives emphasize the importance of student success and effective student support services. Conceptually, the student services plan is shaped around an institutional commitment to integrate bachelors-level programming fully into existing governance structures, services, and academic department roles. It is anticipated that, at capacity, the proposed Product Development program will have at least 45 students. Skagit Valley College currently has three bachelor programs, if approved Product Development will be the fourth. As part of the network of coordinated services that the department chair will facilitate for Product Development students, the college has enlisted help from a variety of campus resources to support Product Development student success.

With the introduction of remote operations due to COVID-19, all student support services are offered both face to face and online to support online, hybrid, and homebound students, offering additional support. With the hybrid nature of the proposed bachelor's degree, students will have more options to access needed coursework and support services.

Academic Advising
Advising availability and accuracy are critical to student success in the proposed applied bachelors in Product Development. All instructional departments at Skagit Valley College are organized into Areas of Study (meta-majors), the proposed applied bachelors in Product Development will be a part of the Industrial Trades Area of Study. Each Area of Study has dedicated Counselor and/or Navigators to help support and advise students within a given industry cluster.

Drawing from what has proven to be a successful strategy with two-year professional technical programs in the existing applied bachelor's degrees in Environmental Conversation, Applied Management and Application Development (Fall 2022), students will remain with their associate degree advisor until they start the bachelors-level program, and they are transitioned to an applied bachelor's degree faculty advisor. Product Development students will be assigned a faculty advisor within the proposed Product Development program. With a faculty advisor, Product Development students will consistently receive the most complete, accurate and current information not only on graduation requirements, but also on industry trends and connections. Further, this faculty-driven advising model leverages classroom relationships between students and their instructors, providing yet another avenue for engagement and retention. Product Development students will also have the seamless support made possible by Skagit Valley College Counseling and Advising Services. While faculty will handle in-program student advising, Counseling and Advising Services will work closely

with the instructional department to offer advising to students when faculty are away from campus as well as support students who are seeking admission into the program.

Professional technical and applied baccalaureate students tend to be older with more challenges and needs than traditional student populations. Along with the general services for Product Development support, the college will provide care for students in the proposed Product Development program who are struggling and for special populations that might need additional attention. Toward this end, the Product Development chair will meet one-on-one with students who need special consideration. If needed, the chair will set follow-up appointments with faculty, counseling, disability access services, and/or veteran's services. Along with department chair's response to students in need, the college has designated several services to address retention and success for Product Development cohorts such as academic early alert services, Veteran's services, and the academic support center with general and specialized tutoring services.

Academic Early Alert Service

The proposed program design emphasizes close contact between the students and their lead instructors, who will act as the students' academic advisors. Throughout the quarter, students missing class will get a phone call to check on the reason they are missing school. They will be advised on any resource that may be available to resolve their issues. At the midterm of the first quarter, a grade check will go to each student and primary faculty advisor. Students who have earned below a 2.50 in any of their core classes will be required to meet with their advisor. An appropriate plan for additional support will be developed between student and advisor. In addition, regardless of their GPA, all students will also be required to meet with their advisor at the end of their first quarter, as well as at their 45-credit threshold, to assess their progress. Generally, students are advised to check in with their advisor at least once every quarter.

Access Services

The Product Development department chair will work with the college's Disability Access Services to provide students with counseling and reasonable accommodations to support their learning. The Disability Access Services office at Skagit Valley College is committed to ensuring equal access to all programs, services, and activities for qualified students with disabilities. This office is also dedicated to working with students, staff, and faculty in developing and implementing the most appropriate strategies for a successful learning experience while maintaining the academic standards and integrity of the mission of the College.

Library Services

The Skagit Valley College librarians are tenured faculty with advanced degrees and the practice and skills to work with Product Development students on high-level research projects. College librarians are playing an integral role in SVC's existing BAS degrees through the identification and selection of OER resources, student research projects and curriculum design and delivery particularly as it relates to information literacy. In addition to working with individual students and providing classes in information literacy, librarians routinely assist faculty members on research projects or in their studies for advanced degrees. The Skagit Valley College Library has a reference librarian on duty whenever it is open as well as a librarian on-line. In addition to the usual services, the Library provides study rooms, interlibrary loan, and a quiet study area. It has over 40 computers available to students, with full search capabilities and Microsoft Office software (Word, Excel, PowerPoint, etc.) as well as CAD ready laptops. Regarding information resources, the library is using additional collection development institutional funds to actively select and acquire monographs directly related to the proposed Product Development program, with the intent to build a collection to support study and research at the undergraduate level. A reference librarian will be appointed to act as a liaison to the proposed Product Development program faculty, collaborating with them to select relevant titles.

These selections are based on the curriculum that has been developed for the degree. With the introduction of remote operations due to COVID-19, library services have increased their systems and services to accommodate an online platform, librarians and library services are more accessible to online and hybrid students.

Information Technology Services

The Information Technology department provides and maintains the technology infrastructure to support all instructional and administrative operations at all Skagit Valley College campuses as well as for remote learning. The Information Technology (IT) department provides a Help Desk on both campuses and sends IT staff to offices and labs to troubleshoot hardware and software problems. IT staff members are knowledgeable and experienced in campus software programs and provide service to faculty and staff. Student interns from the computer science instructional program help supplement IT department support and provide excellent student learning experiences in a complex network and computing environment. All issues and incidents are tracked using a ticket system. All students can get help using computers and technology from the IT Helpdesk, available in person or online via email, text, or chat from 8:00 a.m. to 8:00 p.m., Monday through Thursday, and 8:00 a.m. to 5:00 p.m. on Fridays. Issues involving coursework and Canvas are escalated to eLearning specialists.

Writing & Math Centers

Skagit Valley College's English Department has developed a Writing Center to support writing assignments at all levels in the college. Students can drop in or make appointments. Tutors and faculty will assist students in crafting their writing assignments. The Writing Center also supports Applied Bachelor degree program applicants with their personal statements through specifically tailored coaching sessions. Similarly, the Math Department offers math tutoring from developmental math courses to advanced calculus and statistics. This level of math tutoring will be appropriate for the Product Development students to succeed in their math assignments. These services available both on-campus and online.

Veteran's Services

In Enrollment Services, Veterans Services is the liaison between the federal Veterans Affairs (VA) and veterans and dependents, helping veterans use their VA benefits for their education at Skagit Valley College. This office connects students with on- and off-campus resources to meet needs that may be affecting their academic performance. Students can also access one-on-one counseling or support in a group setting through informal gatherings of veterans, dependents, and allies to discuss anything of concern or interest to the students. A veteran's club through Student Leadership provides more opportunities for advocacy and community buildings. Counseling and Advising Services supports veterans by providing ongoing counseling for issues related to adjustment to college, stress management, and PTSD symptom management. Counseling also provides referrals to appropriate long-term services such as VA, counseling for disability accommodations, and other specialized support.

Financial Aid

Skagit Valley College will provide a comprehensive financial aid package to all admitted and eligible Product Development students. The Financial Aid Office will work to ensure that students have access to as wide a variety of funding options as possible and will consider the unique needs of special populations, such as veterans. Required documents and deadlines will be consistent for all Skagit Valley College students. Aid will be packaged based on eligibility and availability of funds. Financial Aid staff run dedicated sessions for applied bachelor students at Skagit Valley College.

The Dean of Financial Aid and her staff are committed to helping students understand the financial aid application process and guidelines. The Skagit Valley College Financial Aid office is preparing for the unique needs, experiences, and situations of the BAS student. The Financial Aid Office has already gone through the processes with the Department of Education and Department of Veterans' Affairs to offer financial aid to BAS students for the BAS in Environmental Conservation program and the Applied Management program. As such, the college is prepared to complete the process required to offer financial aid to Product Development students.

Career Advising
Product Development students will gain valuable work experience through the capstone program. Students will meet with Product Development faculty teaching the manufacturing practicum to review the requirements and process. Faculty across applied bachelor degree programs are also actively exploring cross-program internship opportunities to provide additional opportunities for learning. For example, an Applied Management student with an interest in manufacturing may work on an internship project to help Product Development students create marketing plans for products they create.

Skagit Valley College is prepared to serve Product Development students with resources and guidance to support their post-graduation goals:
- The program will identify appropriate resources for Product Development candidates whose intentions are to continue further on their academic path, including bridges to Master's level programs. Career Services will provide GRE and GMAT preparation workshops and specific help in choosing graduate programs and assembling application materials.
- Skagit Valley College's Product Development faculty will develop articulation agreements with specific graduate programs and communicate this to students during advising sessions. As with all transferring students, the faculty advisors will guide the students in what classes they need to focus on for their chosen career path.
- To successfully assist program graduates with job placement, Counseling, and Advising Services and Product Development faculty will acquire resources about placement opportunities relevant to these new career pathways. These resources will be available in individual sessions and in curriculum for career exploration courses. The program will collaborate with advisory councils and industry internship site hosts to stay current on new career pathways and job opportunities for graduates. The program will also identify opportunities for students to establish mentoring relationships within the technology community.

Criteria 5
Commitment to build and sustain a high-quality program.
Program Funding
The tuition revenue from tuition and fees in the proposed Product Development Program is designed to be offset the expenses. Skagit Valley College has also committed to fund the costs associated with program launch through funding from College local funds.

Anticipated Program Revenue
Per Table 1, program revenue will include an initial investment from Skagit Valley College local funds for the first two years. Beyond that, the program expenses of the program will be offset by tuition revenue. Revenue assumptions include:
- Initial enrollment will be at 15 FTEs and will grow to 37 FTEs by Year 5. The program will have anticipated attrition rate of approximately 15-20% between the first and second years, as

well as anticipated growth in cohort size for first year students as the program becomes established.

- A new cohort of students will start every fall, with full-time students only. "Full-time" students are defined as taking 45 credits per year.
- Skagit will provide additional support for the development year of program funding from college local funds reserves as shown in the Projected Program Expenses table under "College Support"
- The operating fee portion of tuition and fees is assumed as revenue support to the program and is based on 2021-22 Upper Division rates as published by the SBCTC. Revenue is calculated at approximately $2,654 in tuition and fees per 15-credit student per quarter. Minimal future tuition increases are currently factored into expected revenues at 1.024 percent annually.
- The College is committed to divert the bachelor's tuition revenue in order to provide necessary support to the bachelors-level degree program.

Projected Program Expenses
Per Table 1, in year one, program expenses are limited to a full-time faculty member, with instructional support increasing as enrollment grows over the course of five years. The financial plan assumes the following:

- Pre-program launch costs include a full-time faculty that leads curriculum development and expert evaluators. After program launch, duties related to curriculum development, industry relationships, advising, and managing program resources are included within the full-time faculty role as outlined in the Skagit Valley College Faculty Collective Bargaining Agreement.
- No additional equipment is anticipated for this program.
- Faculty and staff fringe benefits have been separately calculated for each position on the same bases as are used in the college budget. All positions are assumed to be benefited.
- No dean oversight will be charged to the program. The Executive Dean of Instruction, Dr. Darren Greeno, will supervise the Product Development program.
- No overhead or indirect changes will be assessed against the program. The Executive Dean's office organizes and schedules faculty evaluations, manages the program's review, and collaborates with the Product Development department chair to maintain the program budget, professional development, and curriculum development.
- The program will not require any additional support staff expenditures. Skagit Valley College uses an integrated, holistic approach to support services. Baccalaureate level students utilize the same student services and faculty advisors as all Skagit students. While librarians, navigators and counselors are assigned based on Areas of Study clusters, there are no specialty advisors or student support staff for targeted programming, including bachelors programs.
- The program will not require any additional facilities or specialized equipment beyond a classroom and office space. Computer labs will provide necessary technological support for students enrolled in classroom and hybrid courses. The college's learning management system, CANVAS, will be utilized by program faculty and supported by Skagit Valley College's eLearning department. Resources to facilitate online learning, such as Panopto, will be integrated in course shells and utilized to provide additional support for program students.

Table 1: BAS- Product Development Budget 2022-2027

FTE Projections	2022-23 Development Year	2023-24 FTE	2024-25 FTE	2025-26 FTE	2026-27 FTE
Course Sections Offered Per Year	0	9	18	18	18
Est. enrollment Per Course by type*	0	15	30	35	37
Average Credits Per Course by type	0	5	5	5	5
Total Credits taken	0	45	45	45	45
AFTE	0	15	30	35	37

Revenue Projections	2022-23 Development Year	2023-24 Revenue	2024-25 Revenue	2025-26 Revenue	2026-27 Revenue
Tuition Revenue	$0	$122,409	$250,693	$299,495	$324,208
College Support - One Time	$69,000		$0	$0	$0
Total Revenue	$69,000	$122,409	$250,693	$299,495	$324,208

Cost Projections	2022-23 Development Year	2023-24 Budget	2024-25 Budget	2025-26 Budget	2026-27 Budget
Full-Time Faculty**	$50,000	$70,000	$70,000	$70,000	$75,000
Associate (PT) Faculty			$65,000	$65,000	$65,000
Salary Total	$50,000	$70,000	$135,000	$135,000	$140,000
FT Benefits	$19,000	$26,600	$26,600	$26,600	$28,500
PT Benefits			$13,000	$13,000	$13,000
Benefits Total	$19,000	$26,600	$39,600	$39,600	$41,500
Meetings			$250	$250	$250
Chair Stipends		$8,000	$8,000	$8,000	$8,000
Stipends Total	$0	$8,000	$8,250	$8,250	$8,250
Department Travel		$500	$500	$500	$500
Department G&S		$250	$500	$500	$500
Lab/Student Expenses		unknown	unknown	unknown	unknown
Library		$10,000	$10,000	$10,000	$10,000
Marketing		$2,500	$1,000	$1,000	$1,000
Other Total	$0	$13,250	$12,000	$12,000	$12,000
GRAND TOTAL	$69,000	$117,850	$194,850	$194,850	$201,750

Net Revenue/Cost Projections	2022-23 Development Year	2023-24 Budget	2024-25 Budget	2025-26 Budget	2026-27 Budget
Total Revenue (line 17) - Total Cost (line 44)	$0	$4,559	$55,843	$104,645	$122,458

*Enrollment estimates include anticipated attrition in the second year, as well as anticipated growth in cohort size for first year students. 2023-24 includes 15 new students; 2024-25 includes 20 new students and 10-15 returning; and 2025-26 includes 22 new students and 13-15 returning.

**Full-time faculty rate is an estimated average. Per the faculty negotiated agreement, all faculty are initially placed on the salary schedule that ranges from $60,000 to $80,000. The first full-time faculty position that is hired will also serve as the Department Chair, receiving an additional $8,000 per year. Additionally, this position will likely qualify for a high demand salary differential in accordance with House Bill 2158.

Criteria 6
Program specific accreditation.

Program-specific accreditation is not required for Product Development graduates to be employed. The college currently has the authority to offer applied baccalaureate degrees, demonstrated through the approval and offering of the BAS in Environmental Conservation degree as well as the BAS in Applied Management. Upon SBCTC approval of the proposed applied bachelors in Product Development degree, Skagit Valley College will apply to the Northwest Commission on Colleges and Universities (NWCCU) outlining the major substantive change. The application will be submitted to NWCCU in Spring 2022 with an expected response during Summer Quarter. This will allow the 2022-2023 academic year for securing faculty, curriculum development, marketing and recruitment. The college will await a response from NWCCU prior to any marketing or recruitment efforts for the proposed Bachelors in Applied Science in Product Development.

Criteria 7
Pathway options beyond baccalaureate degree.

Upon full program approval, one of the objectives of the new Product Development faculty department chair will be to explore transfer opportunities and work with their Dean to begin articulation discussions. Skagit Valley College will seek articulations with Central Washington University's online Masters of Science in Engineering Technology and Management as well as the many related Master's programs at both University of Washington and Washington State University. In addition, Skagit Valley College will continue to explore graduate program options with other Washington State institutions, as well as online programs, such as Western Governor's University to provide students access to Master's level educational opportunities to further their upward career mobility and increase their earnings potential. The College will also explore opportunities for Product Development graduates at MBA programs, building on relationships established through SVC's BASAM program.

Criteria 8
External expert evaluation of program.

This program was designed with input from several industry stakeholders. Initial concept was discussed at the SVC Manufacturing Advisory Committee meeting on October 29, 2019. The committee provided feedback on the general direction of Product Development. With additional market research, SBCTC Statement of Need approval, and concept refinement, a first draft of the program was shared again with SVC Manufacturing Advisory Committee as well as several additional

regional employers and university representatives. Additionally the content and outcomes were sent out in a survey to 23 industry representatives to provide feedback. The second draft of the program proposal was then reviewed by two external evaluators, Dr. Rajendran of Central Washington University and Dr. Newcomer of Western Washington University. Please refer to Attachment B for biographies of each evaluator, and Attachment C for their full evaluation reports.

Response to External Evaluation
Recommendations for Learning Outcomes
Recommend adding outcomes. Given the proposed curriculum, I am confident that the students will meet the outcomes but listing them will better inform employers in soft skills. (Dr. Rajendran).
What is missing from the learning outcomes is any expectation of the development of nontechnical skills and abilities. Things like communication in multiple modes, teamwork and leadership, ethics and professionalism, and preparation for life-long learning are not mentioned even though most of them are clearly part of the program. I recommend that the learning outcomes be expanded to include some of these areas, for they will be essential to the long-term success of the program's graduates (Dr. Newcomer).

> #### Skagit Valley College Response
> Added two new outcomes based on external evaluators' feedback (*See Criteria 1, page 4*):
> 1. Effectively plan, facilitate and/or lead marketing discussions using principles of effective cooperation, teamwork, and leadership.
> 2. Investigate the way in which personal integrity shapes individual approaches to ethical dilemmas.

Recommendations for General Education
I notice there is one communication course: CMST 210, Interpersonal Communication. It may serve the students well to add a business communication course (Dr. Rajendran). One concern is the fewer MATH requirements (except stats) (Dr. Rajendran).
While the breadth requirements look fine, having only 5 cr. of math and only 10 cr. of basic science seems woefully insufficient for a BAS degree, especially if the basic science requirements are met with something far afield from the degree area, such as Biology. The inclusion of a required statistics course is great, but the students should really have two quarters of algebra-based Physics and math through at least pre-Calculus. For students to be anything other than technicians for manufacturing automation, they need to have some kind of foundation in mechanics and electricity & magnetism. A quarter of Chemistry would also be a good idea. In the ID field, what separates a BS degree from a BA starts with a strong foundation in math and science, so if the graduates of the program are going to work with engineers and ID graduates, they are going to need that foundation too (Dr. Newcomer).

> #### Skagit Valley College Response
> ***Communication*** - Beyond CMST& 210, Reading, technical writing, and verbal communication skills will be taught and practiced throughout the curriculum. Students will be presenting projects, designs, concepts, and practicing professional communication in ART 3xx- Industrial Design CAD Skills with CAM, ART 3xx- Industrial Design Application, BUS 4xx- Entrepreneurship & Innovation, CMST 3xx- Design Presentation, MANF 37x- Product Validation, and MANF 4xx- Manufacturing Practicum.
> ***Math*** - The curriculum team revisited the math requirements. Based on the work done in the 300 and 400 level courses, and what is needed to work in industry, the curriculum team at Skagit Valley College determined the math included in the pathway was sufficient for student success in the program. Calculus limits student access and is unnecessary in the applied field. The focus of the program is on design and product development, not engineering.
> ***Science*** - The curriculum team reviewed the science requirement and determined that Physics with a lab should be added as the recommended to meet the 10 credits required in

Natural Sciences (*See Criteria 1, page 6*): Strongly recommend lab-based Physics (*Based on external evaluators' recommendation*)

Recommendations for post-Graduation

The challenge is going to be to get employers to hire graduates who are versed in all three areas, but not immersed in any of them. I suspect, though I do not know, that smaller companies – ones that are not large enough to have many specialists or start-up companies – will be more likely to find graduates of this program attractive than larger, more siloed companies (Dr. Newcomer).

This program will not prepare students well for graduate degrees in engineering or ID, but it probably is a sufficient foundation for an MBA degree. That said, I don't think that it is reasonable to expect a graduate of an interdisciplinary BAS program to be prepared for a graduate program in a disciplinary area. This is an industry-focused degree, and it should work well for that purpose, so that it does not prepare students for graduate work is not a shortcoming in my opinion (Dr. Newcomer).

Skagit Valley College Response

Masters - Skagit Valley College Manufacturing and Product Development faculty and Deans will work with graduate programs to develop articulation agreements. Graduates will have their applied baccalaureate degree, a solid portfolio or designs and developed products, as well as applied technical experience making them an asset to any master's level program.

Employers - Through many conversations and meeting with the advisory committee as well as other regional employers, graduates of the proposed program will be competitive candidates as advanced technicians at larger companies, and product and prototyping engineers at small to medium companies. These are both high wage and high demand employment tracks in this market

Recommendations for Faculty

The only weakness that I see in the [faculty] plan is that the program will essentially be dependent upon a single individual, and therefore will have continuity challenges anytime that position becomes vacant. For accredited engineering programs we generally want a minimum of 3.0 FTE with at least two of them being permanent positions to ensure program stability and continuity, so I would advise having at least two permanent positions for this program if that is fiscally possible (Dr. Newcomer).

The salary range for the faculty member seems low given the expectations for the position. I think if there were two faculty members and they covered the required technical and experiential areas between them, then the salary range could be fine. (Dr. Newcomer).

Skagit Valley College Response- The proposed program will have 1.0 full time faculty as well as associate faculty that have appropriate subject matter expertise. Once the program is full with two cohorts, the faculty representation will be closer to 2.3 faculty. This model has been successful in each of the College's bachelor's programs. The listed salary is based on the Skagit Valley College Faculty Negotiated Agreement, and includes additional High-Demand Salary stipend. It is not an option to adjust the salary for specific programs, this is the prevailing wage at community and technical colleges.

Recommendations for Advisory Committee

An Industrial Advisory Committee (IAC) for the program is an excellent idea, I would go so far to say that it's a necessity for its long-term success, but I didn't find anything in the proposal beyond the intention to create such a committee. Given the interdisciplinary nature of this program, it will be important that the IAC has each of the three major areas of the program represented by multiple people (Dr. Newcomer).

Skagit Valley College Response- All workforce programs, including bachelor's level programs, have a formal Advisory Committee comprised of industry representatives, current or former students, and college faculty and administrators. The proposed degree will share the

Manufacturing Advisory Committee and members that work in roles similar to the intended jobs graduates will prepare for. This was added to the introduction to Criteria 8.

Related Attachments
Attachment B: Evaluator Biographies
Attachment C: Evaluation 1- Dr. Sathyanarayanan Rajendran; Evaluation 2- Dr. Jeff Newcomer

Conclusion
Skagit Valley College's proposed Bachelors of Applied Science in Product Development will combine theoretical knowledge, analytical problem solving, and practical hands-on skills in a working production lab to prepare product design and development professionals for the challenges of leading projects, people, and innovation. The program is supported by significant industry demand as demonstrated in the Statement of Need, as well as by regional employers. The BAS-Product Development was designed with extensive input from our Advisory Committee, additional industry representatives, SVC faculty and staff, and well as external subject-matter experts. Consistent with our mission, this degree path is a commitment to provide high-wage, high-demand programming to our students that will lead to educational, personal, and economic success in the advanced manufacturing and engineering industry.

Attachment A
Course Outlines

Quarter 1 Total Credits: 15

ART 3xx (5cr) Industrial Design CAD Skills with CAM

This course develops a student's understanding and practice of the techniques for producing digital interpretations of designs. The techniques covered include various modeling techniques with presentation as the deliverable. The course culminates with the presentation of a design concept for faculty review.

Outcomes – After completing the course, the student will be able to:
1. Utilize digital tools to communicate design ideas.
2. Demonstrate the ability to develop digital simulations using CAD tools.
3. <mark>Communicate</mark> design functionality utilizing modeling tools.

Course Content:
1. Digital sketches
2. Solid modeling
3. Surface modeling
4. Mesh modeling
5. Parametric modeling
6. Prototyping
7. Assembly simulation
8. Design presentation

Prerequisite: Admission to BASPD program and BASPD Director permission.

ENGR 3xx (5cr) Materials for Design

This course explores the fundamentals of materials technology for product development, including how the structure and properties of materials influence the selection of primary materials. Students apply the acquired materials knowledge to the current design project (ART 3XXX)

Outcomes – After completing the course, the student will be able to:
1. Compare and contrast the properties of natural and engineered materials used in contemporary industry.
2. Conduct common destructive and nondestructive testing methods used in industry to assure appropriate use of material.
3. <mark>Communicate</mark> design functionality through functional and economic analysis.

Course Content:
1. Chemical properties of materials
2. Structural properties of materials
3. Mechanical properties of materials
4. Environmental and health issues related to material selection
5. Material testing techniques
6. Product specifications

Prerequisite: Admission to BASPD program and BASPD Director permission.

MANF 3xx (5cr) Production Tooling and Automation

Students will apply practical manufacturing techniques to theoretical challenges. Concurrent with Art 3xx and ENGR 3xx, students will design tooling, fixtures, and automation solutions for design

challenges. The resulting designs incorporate conceptual exploration with the practical demands of the SVC Production Lab.

Outcomes – After completing the course, the student will be able to:
1. Provide detailed automation solutions for a concept product.
2. Demonstrate the ability to create tooling for a new product.
3. Analyze the economic impact of manufacturing decisions as applied to the operation of the Production Lab.

Course Content
1. Tooling requirements
2. Limited run vs production run decisions
3. Automation applications
4. Gage R&R
5. Inspection options
6. Fixed and variable costs

Prerequisite: Admission to BASPD program and BASPD Director permission.

Quarter 2 Total Credits: 15

ART 3xx (5cr) Industrial Design Application

Using a team approach, this class emphasizes a comprehensive design process including market research, iterative ideation, virtual prototyping and design implementation. Through the design of various products, students develop problem solving skills throughout the design process.

Outcomes – After completing the course, the student will be able to:
1. Employ a product design and development process to create and communicate a plan that will take a product idea from concept to production. (PLO1)
2. As part of that process, choose appropriate materials and tooling needed for developing an eventual production plan.
3. Demonstrate the ability to interact with a manufacturing team in a cooperative and productive manner.
4. Accurately document the revision process using industry standards.
5. Actively participate in a team presentation of that plan relative to a production environment.

Course Content
1. Product development tools.
2. Generative design
3. Application of CAD for CNC and CAM
4. Team development
5. Revision processing
6. Prototype methodologies

Prerequisite: Admission to BASPD program and BASPD Director permission.

BASAM 322 (5cr) Project Management

Examine the importance of project management as a key managerial competency and investigate the ways in which key project management concepts and tools integrate into an operational model. Analyze the connections between project management and other management functions and define the characteristics of effective project management and managers. Investigate the ways in which bias can impact effective project management and develop mitigating solutions.

Outcomes – After completing the course, the student will be able to:
1. Analyze the relevance of project management by critiquing application in student's field of interest.

2. Determine the characteristics of effective project management and managers by researching global standards and tools such as scrum, agile and those from the Project Management Institute.
3. Integrate key project management concepts by formulating a comprehensive project management plan.
4. Analyze the impact of current and emerging project management technology by researching its common applications.
5. Examine the impact of managerial bias on effective project management by evaluating decision making models.

Course Content
1. Project management.
2. Specific project management techniques as identified by the global standards from the Project Management Institute.
3. Professional level competency in the practice of Project Management.
4. Project planning activities that accurately forecast project costs, timelines, and quality.
5. Project Management software.
6. Change management theory in project implementation planning.
7. Team strengths and weaknesses and plans to maximize team performance.

Prerequisite: Prerequisite: Admission to BASPD program and BASPD Director permission.

ECON 3xx (5cr) Economics of Product Development

This application of micro- and macroeconomic theory explores the relationship between new product development and a company's economic system. Topics include economic systems, the influence of governments on the economy, market structures and competition, resource allocation, production, pricing, consumer choice, and externalities. Students us both qualitative and quantitative analysis to inform design decisions.

Outcomes – After completing the course, the student will be able to:
1. Explain the role of regulation by using concepts and models of governmental oversite of financial markets.
2. Identify different market structures and explain their impact on competition and strategic interaction.
3. Demonstrate the relationship between cost, consumer choice, and pricing by using models of market forces.
4. Recognize external costs and benefits associated with business activity, and develop strategies for lowering costs, increasing benefits, and managing trade-offs.
5. Perform financial analysis of product development decisions.

Course Content
1. Qualitative analysis
2. Quantitative analysis
3. Investment decisions
4. Sensitivity analysis
5. Trade-off decisions
6. Global markets

Prerequisite: Admission to BASPD program and BASPD Director permission.

CMST 3xx (5cr) Design Presentation
Within the context of developing a design presentation package, this course provides an overview of communication processes involved in marketing interactions and collaborative decision making related to generating proposals and presenting a completed design concept. It focuses on applications of decision making, problem solving and presentation skills

> Outcomes – After completing the course, the student will be able to:
> 1. Demonstrate teamwork, leadership, professionalism, and the ability to communicate requirements, ideas, and concepts critical to success. (PLO2)
> 2. Effectively plan, facilitate and/or lead marketing discussions.
> 3. Strategically plan development goals, processes, and outcomes using principles of good decision making and problem solving.
> 4. Identify and develop presentation strategies for various target audiences.
> 5. Use appropriate forms of media including presentation and analysis tools, to deliver a design concept to a target audience.
> 6. Analyze data to improve individual and group performance and market success utilizing appropriate data collection tools.
>
> Course Content
> 1. Design presentation
> 2. Market awareness
> 3. Systems Theory
> 4. Small Group Communication Theory
> 5. Strategic Planning
>
> Prerequisite: Admission to BASPD program and BASPD Director permission.

BASAM 330 (5cr) Operations Management
Explore and apply the concepts, principles, problems, and practices of operations management in different sizes and types of goods producing and service organizations. Topics include operations strategy, process design, capacity planning, facilities location and design, forecasting, scheduling, quality assurance, continual improvement and operational effectiveness, environmentally sustainable practices, and inventory management.

> Outcomes – After completing the course, the student will be able to:
> 1. Identify established and emerging elements of Operations Management (OM), including technology, by researching student's application in OM and non-OM situations.
> 2. Identify the relationships between management, OM, and other management functions within an organization by analyzing the enterprise impact of decisions.
> 3. Analyze how the Operations Management function can influence operational actions to address community/societal challenges such as water pollution, plant emissions and disposal of hazardous material by critiquing relevant applications in student's field of interest.
> 4. Determine ways to counteract the impact of bias on operational effectiveness by applying tools such as root cause analysis.
>
> Course Content
> 1. Various elements that comprise the field of operations management (OM), and some of the new and evolving concepts within OM.
> 2. OM tools and concepts and apply them to a wide variety of situations, including non-OM related areas.

3. Relationship between leadership in management, OM, and other management functions within an organization.
4. The role of technology in OM.
5. OM tools to solve common manufacturing and service industries operations.
6. Impact of OM decision-making on social, environmental and economic bottom line.

Prerequisite: Admission to BASPD program and BASPD Director permission.

MANF 37x (5cr) Product Validation

Through research of the applicable standards, students define the functional parameters of a specific design. The prototypes developed in MANF 36x will be benchmarked against competitive designs. The scope of production will be explored through forecasting. Develop control models from the final product design, to be utilized by the production team.

Outcomes – After completing the course, the student will be able to:
1. Analyze industrial standard literature as it applies to testing and validation of a product design. (PLO3)
2. Extract relevant testing parameters from design models.
3. Identify design testing environments appropriate to validate a product relative to market needs.
4. Use appropriate tools to analyze the acquired data relative to the design.
5. Quantify product scope relative to market needs.
6. Use standardized tools and media to communicate the control models to the production team.

Course Content
1. Forecasting principles
2. Design for manufacturing principles
3. Robust design
4. Design for environment
5. Testing system design
6. Data analytics

Prerequisite: Admission to BASPD program and BASPD Director permission.

YEAR 4

Quarter 4 Total Credits: 15

BUS 4xx (5cr) Supply Chain Management

This course examines the principles, techniques, and practices for the design and management of integrated supply chain operations. Participants investigate supply chain strategy, distribution, facility location decisions and purchasing as applied to the information systems used in the management of the SVC Production Lab and the development of products for the Lab.

Outcomes – After completing the course, the student will be able to:
1. Explore the intricacies of global supply chains.
2. Demonstrate supply chain management skills and procurement techniques.
3. Demonstrate knowledge of inventory management techniques.
4. Convey the characteristics of effective supplier relationships.
5. Create an effective supply chain for the manufacture of a new to market product.

Course Content
1. Issues, goals and trends in modern supply chains.
2. Components of supply chain management
3. Global supply chains
4. Procurement techniques
5. Inventory management technique

6. Logistics
7. Effective supplier relationships
8. Case project

Prerequisite: Admission to BASPD program and BASPD Director permission.

MANF 4xx (3cr) Prototyping

In conjunction with MANF 37x, students explore and implement several iterations of the product design to confirm functionality, customer satisfaction and manufacturability. Students start with feasibility studies, move to visual and functional prototypes. The culminating project runs the alpha prototype through the Product Validation process.

Outcomes – After completing the course, the student will be able to:
1. <mark>Implement various strategies for concept testing of a new product prototype in an industrial environment. (PLO4)</mark>
2. Produce physical models for analysis using appropriate modeling tools.
3. Interpret CAD data through finite element analysis.
4. Determine validity of a design concept as it relates to product design and market needs.

Course Content
1. Physical prototypes
2. Analytical prototypes
3. Comprehensive prototypes
4. Focused prototypes

Prerequisite: Admission to BASPD program and BASPD Director permission.

MANF 4xx (7cr) Practical Design Applications

This studio course work focuses on entrepreneurialism. Students identify the business aspects of industrial design and apply these principles to their design projects. Initiating the process of realizing their finalized design, students begin to develop the processes and infrastructure to progress into full production.

Outcomes – After completing the course, the student will be able to:
1. Apply business principles to design requirements.
2. Explore production infrastructure to satisfy design constraints.
3. Plan capacity while mitigating production constraints.
4. Develop a production model concept.

Course Content
1. Capacity/cost trade-offs
2. Quality/cost trade-offs
3. Deliver/quality trad-offs
4. Vendor capacity analysis
5. Alternative production models

Prerequisite: Admission to BASPD program and BASPD Director permission.

Quarter 5 Total Credits: 15

PHIL 4xx (5cr) Ethical/Economical Product Development

An examination of the role of ethics and social responsibility in business. Theoretical concepts in business ethics will be applied to challenges faced in the development of ethical products and processes. The course emphasizes person integrity, contemporary trends, and corporate

responsibilities with respect to legal, economic, and regulatory conditions while still addressing the needs of stakeholders in the marketplace.

Outcomes – After completing the course, the student will be able to:
1. Assess the influence of forces such as implicit and explicit bias, profit maximization and social justice on ethical choices by researching the drivers of managerial decisions in case studies and/or how they apply to business cases relevant to the Production Lab.
2. Define personal ethical outlooks, which recognize and reflect the impact of personal bias using, but not limited to, the intersection of ethical theory and autoethnographies.
3. Investigate the way in which personal integrity shapes individual approaches to ethical dilemmas. (PLO5)
4. Experiment with and experience the consequences of ethical decision making within a business context through role play and repeatable decision models.

Course Content
1. Theoretical perspectives and considerations.
2. Implicit and explicit bias
3. Profit maximization and social justice in ethical choices
4. Personal ethical outlooks
5. Decision simulation and practical application
6. Ethical/Financial trade-offs
7. Case studies/simulations

Prerequisite: Admission to BASPD program and BASPD Director permission.

MANF 4xx (3cr) Contracts and Vendor Relations

In this course, students participate in vendor screening and selection. The course applies sound supply chain principles to the validation of vendor relations and ultimately to the final negotiations of contracts with manufacturing suppliers.

Outcomes – After completing the course, the student will be able to:
1. Validate vendor core competencies through direct evaluation of vendor processes and capabilities.
2. Inspect appropriate vendor financials and physical facility through direct visits as needed.
3. Select the appropriate supply chain partnerships based on core competencies as they apply to manufacturing needs within the Production Lab.
4. Negotiate production contracts to mutual satisfaction.

Course Content
1. Vendor research
2. Vendor meetings
3. Financial analysis
4. Facilities inspection
5. Risk analysis
6. Capacity analysis
7. Contract negotiation

Prerequisite: Admission to BASPD program and BASPD Director permission.

MANF 4xx (7cr) First Article Inspection and Process Control

Participants capitalize on lessons learned through the design validation process to design robust inspection protocols for production. Through the First Article Inspection process, product

design/production process compatibility is validated. Inspection process documents are developed to ensure consistent product quality.

Outcomes – After completing the course, the student will be able to:
1. Evaluate first article products using appropriate inspection equipment and software.
2. Analyze product variation to defined design and production tolerances.
3. Validate production reliability utilizing appropriate inspection processes and stress testing.
4. Create appropriate inspection protocols based on first article inspection and knowledge gained from design iteration.
5. Develop process documentation based on defined standards.

Course Content
1. First Article Inspection from production
2. Vendor First Article Inspection
3. Statistical control analysis
4. Robust design principles
5. Inspections methods
6. Control documents

Prerequisite: Admission to BASPD program and BASPD Director permission.

Quarter 6 Total Credits: 15

BUS 4xx (5cr) Entrepreneurship and Innovation

This course puts the foundations, theory, and process of innovation knowledge into practice. Students apply their skills and capabilities within the context of an existing organizational structure to launch a product into production.

Outcomes – After completing the course, the student will be able to:
1. Manage personnel in a new production line including assignment of responsibility, training, mentoring etc.
2. Communicate control standards to manufacturing personnel necessary to manage production.
3. Develop maintenance parameters based on TPM standards.
4. Interface with customers regarding order inquiries, quality concerns, returns etc.
5. Coordinate delivery, installation, and installation schedules.

Course Content
1. Personnel management
2. Customer service
3. Inventory control
4. Logistics
5. Maintenance
6. Installation

Prerequisite: Admission to BASPD program and BASPD Director permission.

MANF 4xx (3cr) Enterprise Resource Planning

This course utilizes the of systems and planning tools used in manufacturing. Students develop and deploy a product program within an enterprise resource planning (ERP) system, while applying practical applications of material requirement planning (MRP), and aggregate planning.

Outcomes – After completing the course, the student will be able to:
1. Utilize graphical and quantitative planning techniques.
2. Develop master scheduling plans using ERP and MRP systems.

3. Translate a master production schedule into material requirements in support of necessary production builds.
4. Utilize the benefits and requirements of MRP as it relates to production material requirements.
5. Operate an Enterprise Resource Planning system in support of production planning.

Course content
1. Aggregate planning
2. Graphical and quantitative planning techniques
3. Master scheduling process
4. Material demand in a master production schedule
5. Material Requirement Planning (MRP)
6. Enterprise Resource Planning (ERP)

Prerequisite: Admission to BASPD program and BASPD Director permission.

MANF 4xx (7cr) Manufacturing Practicum
In this course, students capitalize on the previous two years' experience to realize the product design. The program culminates with a full-scale product launch of finalized design, employing first year Production Lab students as the manufacturing staff. As a final measure, participants capture the process in an oral presentation and capture lessons learned in a formal document for future review.

Outcomes – After completing the course, the student will be able to:
1. Develop and implement a new or improved production line in support of a new or improved manufactured product. (PLO6)
2. Effectively manage the initial production run of a new or improved product.
3. Present a cap-stone review of the design and production process.
4. Capture and document lessons learned for future review and continuous improvement.

Course Content
1. Production management
2. Personnel training
3. Personnel management
4. Operations control
5. Control documentation

Prerequisite: Admission to BASPD program and BASPD Director permission.

Attachment B

Evaluator Biographies

Dr. Sathy Rajendran
Department Chair & Professor of the Engineering Technologies, Safety, and Construction
Central Washington University

> **Bio: Sathy Rajendran,** Ph.D., CSP, LEED-AP, CRIS, ARM, is a Professor and the Chair of the Engineering Technologies, Safety, and Construction Department at Central Washington University (CWU). He leads one of the most discipline-diverse departments at CWU. The ETSC Department houses two graduate degrees, nine undergraduate degrees (four management, three engineering technology, two education-focused degrees), seven undergraduate minors, five undergraduate certificates, and six general education courses. Oversee the use and maintenance of a 97,000 SF department building with over 18 laboratory spaces that house over $4 million worth of instructional equipment. The department consists of 20 full-time faculty and staff, several part-time faculty, with over 600 students. Dr. Rajendran has published numerous articles and overseen grants focused on construction safety research to practice. Sathy has six years of professional construction safety experience and over 12 years of construction safety and health research experience. He has managed workplace environmental, health, and safety programs for construction projects. His experience includes a wide variety of buildings with complex mechanical systems, including hospitals, a biopharmaceutical facility, high-rise condominiums, office buildings, airport projects, parking garages, and a hotel. He holds a Ph.D. and M.S. in Civil Engineering (Construction Engineering Management focus) from Oregon State University and a B.E. in Civil Engineering from Anna University in India.

Dr. Jeff Newcomer
Department Chair and Professor of Engineering and Design
Western Washington University

> Bio: Jeff Newcomer, Ph.D. is a Professor of Manufacturing Engineering and Chair of the Engineering and Design Department at Western Washington University. He has a PhD in Mechanical Engineering from RPI and almost 30 years of teaching experience. This is his 24th year at Western Washington University, and his tenth year as department Chair.

Attachment C
External Evaluations

Evaluation 1

College Name:	Skagit Valley College	BAS Degree Title:	Product Development
Reviewer Name/ Team Name:	Sathyanarayanan Rajendran	Institutional or Professional Affiliation:	Central Washington University
Professional License or Qualification, if any:	PhD, CSP, ARM, LEED-AP	Relationship to Program, if any:	

Please evaluate the following Specific Elements	
a) Concept and overview	Is the overall concept of the degree program relevant and appropriate to current employer demands as well as to accepted academic standards? Will the program lead to job placement?
	Comment: Product development can be an enriching, lucrative, and engaging career path for prospective students. The positions are unique and cover a wide range of responsibilities. The proposed BAS-PD is well put together covering major curricular areas, both technical hard skills, soft skills, and should meet the employer demand in several areas.
b) Degree Learning Outcomes	Do the degree learning outcomes demonstrate appropriate baccalaureate degree rigor?
	Comment: The four program learning outcomes are appropriate for the degree type and area. However, I recommend adding outcomes. Given the proposed curriculum, I am confident that the students will meet the outcomes but listing them will better inform employers in soft skills. Some are adapted from ABET that my programs are accredited by. • apply written, oral, and graphical communication in broadly-defined technical and non-technical environments • function effectively as a member as well as a leader on technical teams. • Evaluate the impact of (products) technical solutions in global, economic, environmental, and societal contexts.
	Does the curriculum align with the program's Statement of Needs Document?

c) Curriculum Alignment		
	Comment: The proposed curriculum is well-rounded and meets the needs stated. The topics are diverse and will prepare individuals to understand the product development life cycle. The final practicum allows students to apply the skills and knowledge learned in their earlier coursework in a real-world situation.	
d) Academic Relevance and Rigor	Do the core and elective courses align with employer needs and demands? Are the upper level courses, in particular, relevant to industry? Do the upper level courses demonstrate standard academic rigor for baccalaureate degrees?	
	Comment: Based on my review, the proposed program does not have any electives. The core courses and topics are discipline- , and content-rich, and the individual course topics will make the graduates well-prepared to enter the industry. The course outcomes of the courses in the curriculum are appropriate for upper-level courses.	
e) General Education Requirements	Are the general educations requirements suitable for a baccalaureate level program? Do the general education courses meet breadth and depth requirements?	
	Comment: The general education component complements the technical and scientific content of the curriculum and sometimes double dips with junior and senior coursework. I notice there is one communication course: CMST 210, Interpersonal Communication. It may serve the students well to add a business communication course.	
f) Preparation for Graduate Program Acceptance	Do the degree concept, learning outcomes and curriculum prepare graduates to enter and undertake suitable graduate degree programs?	
	Comment: The program is well-rounded to prepare graduates to enter and undertake suitable graduate degree programs. One concern is the fewer MATH requirements (except stats). Also, some graduate programs do not accept BAS degree types, but that is changing. At CWU, BAS degrees are accepted by some programs, e.g., MS-Engineering Technology and Management.	
g) Faculty	Do program faculty qualifications appear adequate to teach and continuously improve the curriculum?	

		Comment: There are currently no dedicated faculty for the program. However, the position description for the faculty line to be hired requires adequate qualifications. A Master's and work experience is typical for these programs. The list of seven existing faculty members are well qualified, consistent with the contributions to the program.
h)	Resources	Does the college demonstrate adequate resources to sustain and advance the program, including those necessary to support student and library services as well as facilities?
		Comment: Yes. The college has adequate resources critical to student success from advising, career counseling, DEI, financial aid, etc.
i)	Membership and Advisory Committee	Has the program received approval from an Advisory Committee? Has the program responded appropriately to it Advisory Committee's recommendations?
		Comment: Not applicable.
j)	Overall assessment and recommendations	Please summarize your overall assessment of the program.
		Comment: Overall, a well-put-together program proposal. In my experience, I have reviewed over 50 new program proposals, and this is one of the best. Well-rounded, career-ready program!

Evaluation 2

College Name:	Skagit Valley College	BAS Degree Title:	Product Development
Reviewer Name/ Team Name:	Jeff Newcomer	Institutional or Professional Affiliation:	Professor & Chair, Engineering & Design, Western Washington University
Professional License or Qualification, if any:	PhD	Relationship to Program, if any:	None
Please evaluate the following Specific Elements			
a) Concept and overview		Is the overall concept of the degree program relevant and appropriate to current employer demands as well as to accepted academic standards? Will the program lead to job placement?	

	Comment: The concept of this degree is sound. The learning outcomes and content of the degree show it to be a mix of business, industrial design (ID), and manufacturing, so it fits a niche where those three programs, which already exist at other colleges and universities in the State, intersect. A graduate of this program will not be well prepared to compete with a graduate of a traditional program in business, ID, or engineering for a job entirely in one of those fields, but will be able to connect the three areas in a way that most graduates of traditional degrees cannot. While my field is engineering, not business, I do believe that the graduates of this program will get job opportunities.	
b) Degree Learning Outcomes	Do the degree learning outcomes demonstrate appropriate baccalaureate degree rigor?	
	Comment: The learning outcomes are appropriate for the degree and are at the baccalaureate level. The learning outcomes are very well matched to the curriculum and expectations for the program, and graduates should be able to demonstrate the learning outcomes through their capstone project. What is missing from the learning outcomes is any expectation of the development of nontechnical skills and abilities. Things like communication in multiple modes, teamwork and leadership, ethics and professionalism, and preparation for life-long learning are not mentioned even though most of them are clearly part of the program. I recommend that the learning outcomes be expanded to include some of these areas, for they will be essential to the long-term success of the program's graduates.	
c) Curriculum Alignment	Does the curriculum align with the program's Statement of Needs Document?	
	Comment: The curriculum is well aligned with the program's focus and learning outcomes. It's a nice balance of its three areas, with some appropriate foundation pieces in areas like economics and ethics, and inclusion of appropriate communication and teamwork skills. As an interdisciplinary degree, there is not great depth in any of the three primary areas, but the degree offers a breadth that one will not find in traditional business, engineering, or ID degrees.	
d) Academic Relevance and Rigor	Do the core and elective courses align with employer needs and demands? Are the upper level courses, in particular, relevant to industry? Do the upper level courses demonstrate standard academic rigor for baccalaureate degrees?	

	Comment: The courses are all appropriate for the topic of product development, and they are all courses that one traditionally finds as upper-division courses in baccalaureate programs, with the sole exception of the CAD class, which can be found at both the upper and lower-division levels. It is impossible to claim that the courses do or do not have appropriate academic rigor from three-line descriptions, but I can say that they are appropriate baccalaureate classes and therefore all have the *potential* to have the appropriate academic rigor. There are no classes that are out of place in the proposed degree. The courses, based on my experience in engineering with more limited interaction with ID and business recruiting, are all relevant to employer needs for manufacturing and design firms. The challenge is going to be to get employers to hire graduates who are versed in all three areas, but not immersed in any of them. I suspect, though I do not know, that smaller companies – ones that are not large enough to have many specialists or start-up companies – will be more likely to find graduates of this program attractive than larger, more siloed companies.	
e) General Education Requirements	Are the general educations requirements suitable for a baccalaureate level program? Do the general education courses meet breadth and depth requirements?	
	Comment: This is one area where I think that the students will be underserved. While the breadth requirements look fine, having only 5 cr. of math and only 10 cr. of basic science seems woefully insufficient for a BAS degree, especially if the basic science requirements are met with something far afield from the degree area, such as Biology. The inclusion of a required statistics course is great, but the students should really have two quarters of algebra-based Physics and math through at least pre-Calculus. For students to be anything other than technicians for manufacturing automation, they need to have some kind of foundation in mechanics and electricity & magnetism. A quarter of Chemistry would also be a good idea. In the ID field, what separates a BS degree from a BA starts with a strong foundation in math and science, so if the graduates of the program are going to work with engineers and ID graduates, they are going to need that foundation too.	
f) Preparation for Graduate Program Acceptance	Do the degree concept, learning outcomes and curriculum prepare graduates to enter and undertake suitable graduate degree programs?	
	Comment: This program will not prepare students well for graduate degrees in engineering or ID, but it probably is a sufficient foundation for an MBA degree. That said, I don't think that it is reasonable to expect a graduate of an interdisciplinary BAS program to be prepared for a graduate program in a disciplinary area.	

	Even in my field of Manufacturing Engineering, graduates who want an M.S. degree in the closely related Mechanical Engineering are often required to take one to three undergraduate classes to plug 'holes' in their preparation before starting their graduate work. This is an industry-focused degree, and it should work well for that purpose, so that it does not prepare students for graduate work is not a shortcoming in my opinion.
g) Faculty	Do program faculty qualifications appear adequate to teach and continuously improve the curriculum?
	Comment: The faculty qualifications are more than adequate for the program needs. It's a very specific set of position requirements, so it may be somewhat challenging to fill, but someone who meets the required qualifications and can perform the job duties will be more than capable of teaching, managing, and improving the program. The only weakness that I see in the plan is that the program will essentially be dependent upon a single individual, and therefore will have continuity challenges anytime that position becomes vacant. For accredited engineering programs we generally want a minimum of 3.0 FTE with at least two of them being permanent positions to ensure program stability and continuity, so I would advise having at least two permanent positions for this program if that is fiscally possible.
h) Resources	Does the college demonstrate adequate resources to sustain and advance the program, including those necessary to support student and library services as well as facilities?
	Comment: While I cannot speak to the specifics of facilities and lab equipment, the economic plan for the program is thorough and shows that the program will be self-sustaining as long as the enrollment is relatively close to target levels. I have two concerns with the economic model of the program, both of which revolve around the faculty member running the program. First, as I mentioned above, having a single full-time, permanent faculty member for the program leaves the program vulnerable when that person, for whatever reason, elects to leave the position. Planning for two full-time, permanent faculty members would be a much better way to ensure program stability and continuity. Second, and maybe I'm being pessimistic here, the salary range for the faculty member seems low given the expectations for the position. I think if there were two faculty members and they covered the required technical and experiential areas between them, then the salary range could be fine, but with the position description seeking someone with significant experience and knowledge of several different areas, it is going to be challenging to find someone good with that salary range.

i)	Membership and Advisory Committee	Has the program received approval from an Advisory Committee? Has the program responded appropriately to it Advisory Committee's recommendations?
		Comment: An Industrial Advisory Committee (IAC) for the program is an excellent idea, I would go so far to say that it's a necessity for its long-term success, but I didn't find anything in the proposal beyond the intention to create such a committee. One of the challenges for this program is going to be getting companies to consider hiring students with degrees that are unlike ones they have seen before. Having an IAC will not only get the program good insight into what it needs to do to be relevant to employers and stay that way, an IAC will provide connections to those employers that can be leveraged for projects, internships, positions for graduates, and support through monetary and in-kind donations. Given the interdisciplinary nature of this program, it will be important that the IAC has each of the three major areas of the program represented by multiple people.
j)	Overall assessment and recommendations	Please summarize your overall assessment of the program.
		Comment: I think that this degree has good potential. I've reviewed BAS degrees in engineering technology before, and I've generally found them to be weak and under-resourced in a way that will make them difficult-to- impossible to accredit, which will in turn put the graduates of the degree at a disadvantage throughout their careers. This degree, however, is trying to fill a space that exists between established areas rather than replicate one of them, and it therefore has good potential to succeed. As I mentioned above, a graduate of this program won't be able to compete head to head with a graduate of a traditional program for a job in engineering, ID, or supply chain/operations management, but a graduate of this program will be able to bridge those areas in a way that a recent graduate of a traditional program cannot.