



PROGRAM REVIEW  
*Self-Study Report*

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**Program Name:** Technical Apparel Design

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# Chapter 1. Program Overview

## **Program Description**

Technical Apparel Design is a part-time undergraduate program. Graduates receive a Post-baccalaureate Diploma in Technical Apparel Design upon successful completion of the program. Technical Apparel Design is offered at the Wilson School of Design at Kwantlen Polytechnic University's Richmond campus. The program consists of 30 credits, which are organized across three semesters. This is a cohort-based program which is completed within a 16-month period. The Technical Apparel Design program is a limited intake program with 22 seats available each Fall intake.

Applicants must meet KPU's English requirements and complete an undergraduate degree before they can apply. In order to apply, applicants submit a current resume, two letters of recommendation, and a self-assessment that can be submitted as an 800-1,000 word written paper or a 3-5minute video. Upon approval of these portfolio requirements an interview with the program coordinator is conducted. If the applicant lives in the Lower Mainland, an in-person interview is scheduled. If the applicant lives outside of the Lower Mainland, they are offered the option of doing a phone or video conference interview.

This is a cohort-based program where the majority of students follow the same course path. There are no specializations or laddering into alternate programs and it does not transfer to other programs. The program is managed by a part-time Coordinator and their part-time program assistant. There are three part-time faculty members, each of whom teach in other programs within the Wilson School of Design.

The course map for the Technical Apparel Design program is outlined below:

Semester 1 Fall 12 credits	DETA 5110: Technical Apparel in Context (3 credits)
	DETA 5210: Technical Textile Technologies (3 credits)
	DETA 5130: Creative Innovation (3 credits)
	DETA 5140: Advances in Apparel Production (3 credits)
Semester 2 Spring 9 credits	DETA 5200: Global Business Strategies for Technical Apparel (3 credits)
	DETA 5210: User Experience (3 credits)
	DETA 5230: Strategic Design Direction (3 credits)
Semester 3 Fall 9 credits	DETA 5300: Capstone Project (3 credits)

Appendix A includes a copy of the curriculum profile. Appendix B includes the program description in the course calendar.

Students' skills are developed through a rigorous, hands-on curriculum based on human factors, ergonomics, strategic design, textiles and industry practices. Successful students are typically independent learners who are driven to explore in a creative learning environment. During the first two semesters, students engage in project-based coursework and meet technical apparel industry professionals through guest lectures and industry site visits. In the final semester, students develop their Capstone Project which they then present during a private exhibition attended by technical apparel industry members. Industry members critique their projects and provide constructive feedback. Graduates emerge from the program ready to join the next generation of design innovators as the curriculum prepares students to work in the technical apparel design industry. The majority of Technical Apparel Design graduates are employed in product development, design, or business. Examples of organizations that hire our graduates include Arc'teryx, Lululemon, Mustang Survival, RYU, and Mountain Equipment Co-Op.

### **Brief History of the Program**

The Technical Apparel Design program launched in January 2014 as a result of British Columbia's growing technical apparel industry, which is internationally renowned for quality and innovative designs. With our technical apparel industry poised for growth, companies are looking for talented, trained designers who can generate new ideas and further technological advances in its field. Technical apparel is defined as apparel designed and manufactured primarily for their technical and performance properties for specific end-uses such as sports, recreation, protection, survival, health and well-being, and military.

Through continued discussions with industry partners and faculty, an opportunity to develop a Post Baccalaureate Diploma in Technical Apparel Design was recognized. The 16-month program would act as an accelerator for building talent in technical apparel design, providing design graduates with a deeper level of study in design strategies and innovative technologies that would further their entry into more mid-level positions among BC's technical apparel companies as well as support them towards entrepreneurial endeavors.

This Post Baccalaureate Diploma was developed to address an area of growth in BC's apparel industry. The program not only focuses on the technology development activities that drive product innovation but also provides students with research tools for product development. Leveraging our polytechnic approach to education and training, students and faculty are engaged in applied research at every stage of the textile industry innovation chain. See Appendix E for faculty biographies.

### **External Accreditation**

The Technical Apparel Design program is not currently accredited by any external associations or organizations.

## **Scope of the Review**

This is the first program review that Technical Apparel Design has undergone as this program launched in January 2014. The Self-study report is an integral part of the Technical Apparel Design's Program Review; it provides an assessment of the quality of the program's competitive advantages, industry connections, and curriculum/instructional design methods. In addition, there is an analysis of the quality of services, resources, and facilities from the perspective of students and faculty members. The report concludes with a list of recommendations for the program and a response from the Wilson School of Design's Pro Tem Dean, Andhra Goundrey.

## **Chapter 2. Program Currency and Connections**

### **Competitive Context**

The Wilson School of Design's Technical Apparel Design program is the only program of its kind in Canada. Although this Self-study report requests a brief comparison of similar programs in the Province, we are not able to provide this as there are not any similar programs in British Columbia. There are, however, two programs in the United States of America that can be compared to. These include the University of Oregon's Master of Science in Sport Product Management and the Utah State University's Bachelor Degree in Outdoor Product Design & Development. For more information on our program's admission requirements and standards, see Appendix C. For more information on our credential completion requirements and standards, see Appendix D.

#### *University of Oregon's Master of Science Degree in Sport Product Management*

This is a Master's program that offers students two modes of study: full-time for 18 months or part-time online for 24 months. Tuition is \$2,693.00 USD per credit and the program is comprised of 65 credits. The total cost of the program including fees is \$71,724.00 USD.

Admission requirements include:

- Bachelor's degree from a regionally accredited four-year college or University that is either American or equivalent from a foreign institution
- GMAT or GRE (if GPA is below a 3.0)
- 2-3 letters of recommendation
- Resume
- Product project
- 3 essays

International applicants must also provide financial verification documentation and English competency documents in the form of a TOEFL minimum score of 88 or IELTS score of 7.0 overall. Students enrolled in the full-time program are required to take the following courses within two years. The fall semester courses in first year include: Product Line Management (SBUS 610), Sports Product Branding (SBUS 610), Human Physiology and Sports Products (HPHY 610), Smart Products (SBUS 608), Marketing Research (MKTG 660), and Integrative Project (SBUS 601). The winter semester courses in first year include: Sports Product Design (SPD 610), Practicum in Sports Product Prototyping (SPD 608), Product Development (MKTG 610), Strategic Cost Accounting (ATCG 662), Green Materials (CH 610), and Integrative Project (SBUS 601). During this term, students attend ISPO Munich which is a globally recognized sports and outdoor product trade show. In addition, they will visit the world headquarters for various companies including Adidas, Puma, and Under Armour. The Spring semester courses include: Supply Chain Operations and Information (OBA 577), Marketing Strategy (MKTG 665), Strategic Management (MGMT 614), International Sports Products (SBUS 607), and Integrative Project (SBUS 601). Over the summer students complete a mandatory company internship. The fall semester courses in

second year include: Legal Aspects of Sports Business (SBUS 653), Managing Global Business (MGMT 620), Financial Accounting (ACTG 612), New Venture Planning (MGMT 625), and Integrative Project Go-To-Market (SBUS 601). There is a trip to Asia during this semester which focuses on consumers and manufacturing. There is only one course in second year's winter semester, which is the capstone course.

Students are provided with industry mentors whose priorities are to ensure that each student feels supported throughout the program and to help them reach their career goals upon graduation. There is a program long team project and each team is provided with a coach who works in the industry and helps guide them through the process of bringing their projects to market.

#### *Utah State University's Bachelor Degree in Outdoor Product Design & Development*

The Utah State University offers a four-year Bachelor's Degree that is comprised of 120 credits. Since it is a state University, tuition varies based on where the applicant resides. Tuition for Utah residents is \$7,600 USD per year, which equals \$30,400 USD for the entire program. For applicants residing outside of Utah, tuition costs \$22,000 USD per year and \$88,000 USD for the entire program.

Admission Requirements include:

- \$50 non-refundable application fee,
- High school transcript or GED,
- Official ACT or SAT scores (may be waived for applicants 25 and older), and
- Concurrent enrollment transcripts.

During the first year, required courses for the fall semester include: Introduction to Writing (ENGL 1010), Product Concept Sketching (OPDD 1000), Fundamentals of Design (OPDD 1050), Introduction to Product Creation (OPDD 1100), and Communications Technology (TEE 1010); all of which are worth 3 credits. In addition, students must take Outdoor Product Design & Development (OPDD 1700) which is worth 1 credit. The spring semester includes Color Theory & Design (OPDD 3400), Introductory Sewing for Outdoor Products (FCSE 1040), Computer-Aided Drafting and Design (TEE 1200), Material Processing Systems (TEE 1030), and a Physical Sciences course which could be a first-year chemistry or physics course.

The fall semester in second year's required courses include: Digital Design Technologies for Outdoor Products I (OPDD 4420), Digital Design Technologies for Outdoor Products II (OPDD 4430), Design Thinking, Methods, and Materials (OPDD 3030), and Intermediate Clothing Construction Skills, Principles and Alterations (FCSE 2040), all of which are 3 credits. In addition, students must enroll in Outdoor Product Design & Development Professional Seminar (OPDD 1700) which is one credit. The spring semester in second year's required courses include: History of the Outdoor Product Industry (OPDD 1750), Sustainable Design and Operations (OPDD 2800), Applied Material Science (OPDD 2700), a Quantitative Literacy course, and Intermediate Writing: Research Writing in a Persuasive



Mode (ENGL 2010). Upon completion of the second year, students are subjected to a portfolio review where they must submit their portfolios to determine whether they are eligible to move onto third year courses. In addition, they must have a minimum of a 2.5 overall GPA and a 3.0 GPA in OPDD courses.

Students are required to take a technical elective and a creative arts course in the fall semester of third year, in addition to Aesthetics, Human Factors, and Brand Image (OPDD 4440), Textile Science (FCSE 3030), and Outdoor Product Design and Development Studio I (OPDD 3760). For spring semester, they enroll in a technical elective, a humanities course, and a life sciences course, in addition to Outdoor Product Design & Development Professional Seminar II (OPDD 3700), Creative Teams: Strategies for Successful Designers and Developers (OPDD 3200), Outdoor Product Design and Development Studio II (OPDD 3770).

The fourth and final year's required courses during the fall semester include a technical elective, a social sciences course, an American institutions course, and a humanities or creative arts course, in addition to Senior Design Studio I (OPDD 4750). During the spring semester, students take Outdoor Product Design & Development Professional Seminar II (OPDD 3700) and Senior Exhibit (OPDD 4770) which are both worth 1 credit. In addition, they take three electives including a technical elective, an exploration elective for breadth, and a social science elective. The other course they take is Senior Design Studio II (OPDD 4760).

The technical electives that students are required to take throughout third and fourth year are selected from the following list:

- FCSE 3040 - Advanced Clothing Studies: Patternmaking
- FCSE 3140 - Digital Pattern Rendering
- FCSE 4030 - Textiles and Technology
- FCSE 4040 - Advanced Apparel Studies
- FCSE 4140 - Advanced Apparel Design
- FCSE 4240 - Advanced Gear Design
- FCSE 4510 - Footwear Concepts
- OPDD 4250 - Outdoor Product Design and Development Industry Experience
- TEE 2020 - Computer-Integrated Manufacturing Systems
- TEE 2030 - Wood-Based Manufacturing Systems
- TEE 3270 - Advanced Computer-Aided Drafting
- ASTE 3030 - Metal Welding Processes and Technology in Agriculture

In conclusion, the University of Oregon's Master of Science Degree in Sport Product Management and the Utah State University's bachelor's degree in Outdoor Product Design & Development are both reputable programs with their own respective strengths and weaknesses. The U of O has a graduate level program that prepares students to work in

technical apparel. Our program is an undergraduate Post-Baccalaureate Diploma. We aspire to transform our program into graduate level studies and will look the U of O as a model throughout this process.

### **Program's Connections to its Advisory Board**

The Technical Apparel Design Advisory Board plays an essential role in maintaining the relevance of the program within the industry. Our committee is comprised of industry leaders who provide the necessary perspective to ensure that our graduates are well prepared to contribute to the industry upon graduation. In conjunction with faculty, administration, and students, their role is to help elevate the quality of the program.

British Columbia is home to global industry leaders and we are fortunate to be situated in the center of this technical apparel design hub. Our program collaborates with outstanding individuals who have leadership roles in organizations such as Mustang Survival, Mountain Equipment Co-operative, Arc'teryx Equipment Ltd, and Simon Fraser University. These individuals and their current job titles are listed below. Full biographies for each Advisory Committee member can be found in the Appendix F.

- Charlotte Browning, BA (alumna of Technical Apparel Design program)  
Materials Development Coordinator at Arc'teryx Equipment Inc.
- Shirley Chan  
Director of Product Commercialization at Arc'teryx Equipment Inc.
- Lindsay Bailey BA, JD  
Principal at Lindsay Bailey Law Corporation
- Max Feldman BA, MBA  
Advisor at MDF Advising
- Samantha Kuchmak BA  
Manager of Social & Environmental Responsibility at MEC
- Mark Anderson BME, MBA  
Director of Engineering and Quality at Mustang Survival
- Vanessa Fors, Mustang Survival BDes, MBA  
Category Manager at Mustang Survival
- Dr. Matthew White PhD  
Associate Professor at Simon Fraser University

The Advisory Board meets approximately three times per year. In December, in Jan/Feb (at the beginning of the new year) and in April/May (after the Spring semester ends). In December, the committee attends a private event where the graduating students present their Capstone Projects during a 10-15 minute presentation followed by a question and answer period. This provides opportunity for the Advisory Committee to connect with the graduates and fully grasp the results of our program. During the January/February meeting, the committee meets to discuss the graduation event and other relevant issues. Recommendations are provided on how to improve the graduation event and the program

overall. Our final meeting of the year is in April/May; the agenda for this meeting is created based on discussion topics from the previous meeting, the progress of action items from the previous meeting, and other relevant topics.

An example of an item that arose from last year's Advisory meeting was that our graduates needed more assistance during the transition from school to the workforce. The committee believed that implementing a mentorship program would help ease this transition. This fall semester we launched a mentorship for our graduating students. Our advisory committee provided feedback throughout the development of the mentorship program. Advisory Committee membership is updated on an annual basis. Although the committee signs on for a 3-year term, they were asked annually whether they want to continue to be on the board or complete their term early.

Currently our committee is active and engaged. However, we are looking to add new members specifically who work in product development at Lululemon Athletica, as Lululemon is an industry leader in the local technical apparel industry and they are not currently represented on our board. We are also looking to add a professional who works in Human Resources at a technical apparel company. We want an HR professional to join our Advisory Committee to learn from their experience and knowledge. Their recommendations will help us prepare our students to work in the industry as the interview process is typically the first step to getting hired. In addition, we will ask this HR professional member to send us job postings from their company that would be appropriate for our grads, so that we can help advertise them through our current students and alumni.

Since the program's inception, we have had a number of other Advisory Committee members who have helped mold our program. These members include:

- Meg O'Shea  
Manager of Small to Medium Enterprises, Program Manager of Thriving Vancouver at the Vancouver Economic Forum
- Andrew Clark  
Manager, High Performance and Fitness at the Richmond Oval
- Jason Leggatt  
President at Mustang Survival
- Dr Tom Waller  
SVP Advanced Innovation Chief Science Officer at Lululemon Athletica
- Yogi Dandapure  
Innovation Director at Lululemon Athletica
- Paul King  
President at Kendor Textiles

### **Program's Connections to the Discipline/Sector and Alumni**

Technical Apparel Design is closely connected to the industry through our Advisory committee, guest speakers, local and international class excursions, mentorship program,

our alumni, and various other awards and events. These connections to the sector help our students through valuable experiential learning. As previously noted, we have an active and engaged advisory committee who we connect with on a regular basis to help guide the direction of the program. In addition, they provide valuable insights into the future of the industry.

Examples of industry partners who were brought in as guest speakers in classes throughout 2019 include:

- Kerri Mackenzie  
Materials Innovation Lead at Arc'teryx
- Stella Ho  
Lifestyle Apparel Designer at Arc'teryx
- Bryan Statham  
CEO at Lifebooster
- Sophie Laliberte  
Design and Development Manager at Mustang Survival
- Dr. Tom Waller  
Sr. VP of Research and Development at Lululemon Athletica
- Leah Klesinger (alumna of Fashion Design & Technology Program)  
Product Developer at Lululemon Athletica
- Philip Siwek (alumnus of Technical Apparel Design Program)  
Jr. Designer at Whitespace

Students are taken on experiential learning excursions to local manufacturing and design companies including the Arc'teryx Design Center, Mustang Survival Head Office and Factory, and Lululemon Whitespace. Over the past three years, our graduating students have participated in an international trip to a technical apparel manufacturer to work closely with their product development team to create their Capstone Projects.

Selected members from our Advisory Committee also serve as mentors for our graduating class students. They have been matched with specific mentors for further development of their career goals and to help the students achieve these goals.

Students are encouraged to enter their work for Industry recognition. Philip Siwek, who is a Technical Apparel Design alumnus who graduated from the program in December 2018 entered his Capstone Project to various international design contests. He won two awards including Student Design Research award in Core 77's annual awards and an award from the Industrial Design Society of America. Siwek was hired as a Junior Product Developer at Lululemon's Whitespace. He has spoken to our current grad class to explain which awards he applied for and his process. This is expected to result in more students from our program applying for these awards in the future.

The program participates in Apparel Camp, a yearly conference for the Apparel Industry in Vancouver, with both attendance from students and faculty. In addition, faculty have joined the BC Apparel & Gear Industry Association which was developed to help feed the growing demand for employees in the local technical apparel industry.

### **Program's Connections to Other KPU Academic Units**

The Technical Apparel Design program is not connected to any other KPU academic units. There is potential for overlap with courses in the Fashion Design & Technology program and potentially in other Wilson School of Design programs; however, this requires further research. In the future, we plan to look to the KPU's School of Business for advice and mentorship on how to create graduate degrees as we understand that they are already in the process of creating a Master's degree. We also plan to look into connecting with KPU's Faculty of Science and Horticulture as there could be overlap in equipment that both departments use for future capital requests.

### **Program's Articulation and Credential Recognition Processes**

Technical Apparel Design does not currently have a formal credential recognition process. We review candidates who want to apply for transfer credit on an individual basis. Since the inception of the program, we have never granted course credits. Potential areas where we could grant credits would be with applicants who have formal education and/or professional experience in technical apparel drafting, apparel construction, and textile sciences. The decision would be made by judging the applicant's portfolio and an interview by the course's current instructor. This process needs to be formalized so that we are more prepared in the future, in case this arises.

### **Program's Public Information and Community Outreach**

The processes for providing information about the program to external groups include in person conversations, phone calls, and applicants exploring more about our program through our website. Over the past year, we have increased marketing efforts through sponsoring a Tough Mudder Event and through poster campaigns in Vancouver and Toronto. Both of these campaigns directed potential applicants to the program website for more information. The student survey demonstrates that 93% of students used our website to learn more about the program and 11 of the 13 respondents found the website somewhat useful or very useful.


The processes for providing information about the program to potential applicants includes inviting the applicant for a meeting on campus to review their questions about the program and take them on a tour of the facilities. This can consume a lot of the Coordinator's time as they meet with applicants individually. The first Technical Apparel Design information session was conducted mid-November 2019 and it was successful as it was more efficient than meeting with individual applicants. Two additional info sessions are scheduled for 2020. If applicants live outside of the Lower Mainland, then a phone call or video

conference is scheduled to go over the program details and the applicants' questions. All applicants are directed to the website as well.

Current public information and community outreach practices are appropriate; however, efforts need to be increased to increase awareness of the program. Social media strategy development and collaborations with Chip and Shannon Wilson should be explored as potential avenues to increase program awareness.

## Student Demand for the Program

Over the past five years, student demand for the program has increased by 58%, which is demonstrated by the graph below which is found in Appendix G.


	2013/14	2014/15	2015/16	2016/17	2017/18	% Change	Trend Line
<b>FTE Head Count</b>	12	19	10	9	19	58%	

*Data Source: R:\IAP\A Dashboards\Enrolment\Enrolment Dashboard 2017-2018. By Course. Faculty Course: Design. Department Course: Technical Apparel. Subject: DETA*

As you can see from the table above, there was a decrease in enrollment in 2016/17. This was due to the intake scheduling change, which was approved by Senate at the February 22, 2016 meeting. Up until then, Technical Apparel Design courses were offered year round and intake began in January. Intake was moved to September to improve the alignment of the program with the academic schedule of similarly focused program so that students would have increased access to the resources, personnel and the offered learning activities.

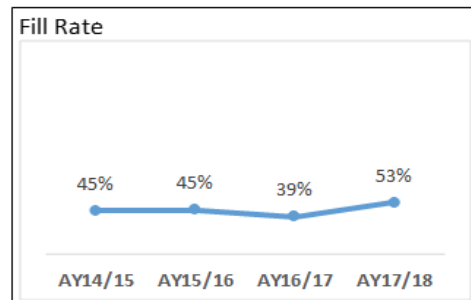
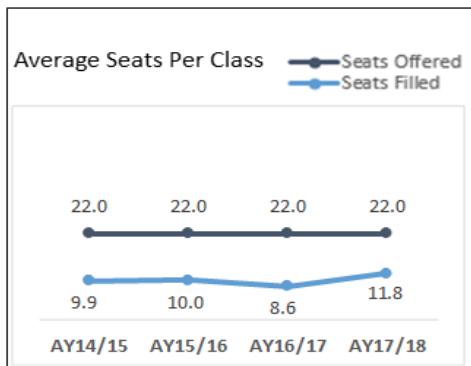
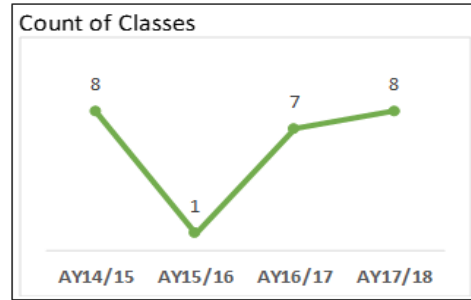
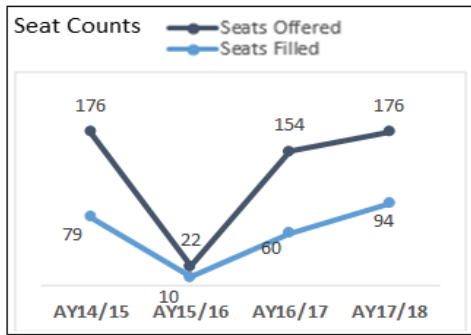
The table below (found in Appendix G) demonstrates how the demand for design courses decreased by 3%, yet Technical Apparel Design has increased by 58% over the past five years.

**Enrolment by Academic Year: Students Enrolled in Design Courses**

	2013/14	2014/15	2015/16	2016/17	2017/18	% Change	Trend Line
<b>FTE Head Count</b>	430	449	424	407	416	-3%	

*Data Source: R:\IAP\A Dashboards\Enrolment\Enrolment Dashboard 2017-2018. By Program. Program Faculty: Design.*

Although Technical Apparel has not achieved its average class size target of 22, as you can see from the graphs below (from Appendix G: Administrative Data Report), we are trending in the right direction. More effort needs to be put into spreading awareness of the Technical Apparel Design program across Canada.



Other methods to increase student demand for the program include increasing the number of credits to include an optional co-op/internship course at the end of the program. There are three reasons why we would increase the length of the program by adding an internship component, they include:

- (1) During our Advisory Committee meetings, the Committee suggested that students would be more prepared to work in the industry upon graduation if they were provided with an opportunity to complete an internship or co-op in the field.
- (2) When determining the length of a post-graduation work permit, officers consider the duration of the program of study in Canada. International students who want to work in Canada's technical apparel industry upon graduation will be more attracted to our program if it is two years long because they will be able to apply for a longer Post Graduate Work Permit. This information was determined upon interviewing Kais Louati, Manager of International Recruitment and Admissions, from KPU International.
- (3) Finally, increasing the length of the program by adding an internship component would help strengthen our industry ties and increase program awareness in the industry.

When comparing the demographic profile of the students enrolled in the Technical Apparel Design program to the Wilson School of Design students, our program is more diverse. We have a more equal balance of male to female students than the Wilson School of Design. Since we require that all of our students complete a Bachelor's Degree prior to entering our program, none of our students are younger than 22; unlike the Wilson School of Design

students where 60-70% of them are under the age of 22 years old. We also have a higher percentage of international students, with approximately 20-25% of the cohort being international; whereas only 4-8% of the Wilson School of Design students are international. There are not any factors that limit the program's ability to attract more diverse demographic groups.

According to the student survey, the top three reasons for choosing to enroll in the Technical Apparel Design program include the career prospects and earning potential (86%), the program's connections to industry (57%), and the success of program graduates (57%). Other reasons included the small class sizes and the range of programs and services offered to students.

## **Summary and Recommendations**

In conclusion, the Technical Apparel Design program is the only one of its kind in Canada; there are two other programs in the US which are comparable. We have a strong and engaged Advisory Committee, however we are looking to grow it by adding two more members who work at Lululemon Athletica and an additional member who works in the HR department of another technical apparel company. Technical Apparel Design has strong connections to the industry, which are demonstrated through the number of industry members we have for speaking engagements and other activities with the students. Areas of improvement include improving the program's connections to other KPU academic units, creating a formal recognition process for credits from other programs, and increase student demand for the program. Student demand for the program has increased by 58%, however we need to continue working on spreading awareness of the program in order to fill more seats.

- Conduct research to determine how the Technical Apparel Design program can create stronger connections with the Fashion Design & Technology program at the Wilson School of Design, the KPU School of Business, and the KPU Faculty of Science and Horticulture to develop more mutually beneficial relationships.
- Recruit two representatives, preferably in design and product development from Lululemon Athletica to join the Technical Apparel Design Advisory Committee.
- Recruit a representative who works at a technical apparel company in the Human Resources field to join the Technical Apparel Design Advisory Committee.
- Create a formal program articulation and credential recognition process for potential new applicants who would like to have transfer credits.
- Increase student demand by increasing efforts on spreading program awareness through developing a social media strategy.
- Increase program awareness by creating a marketing campaign that taps into the program's connection with Chip and Shannon Wilson.
- Attract more domestic and international students to the program by increasing the program length to two years; this will be done by adding an additional co-op course at the end of the program.



## **Chapter 3. Quality of Curriculum Design**

### **Assessment of the Curriculum**

#### *Overview of the Program*

Developed in collaboration with industry, the Post Baccalaureate Diploma in Technical Apparel Design is a 3 semester (16 month) program that is suitable for applicants who have completed a Bachelor's degree and want to transition their career into the technical apparel industry. The program prepares students to start their careers in the local and global technical apparel industry by offering opportunities to practice a wide array of hard and soft skills. This program is about designing apparel that improves function and performance in clothing for sports, health, safety and protection through innovative solutions.

By combining new learning from the program with prior academic and professional backgrounds, students develop hybrid ways of thinking that adds value to a technical apparel design company. It is an effective incubator for design ideas and students are encouraged to pursue these ideas through independent research and projects. It connects research, education and business to support, inspire and create innovative approaches to apparel design. Students are prepared for further research through industry and academic projects and collaborations.

#### *Program Competencies*

The knowledge, skills, and behaviours that a student can successfully perform upon graduation from the Technical Apparel Design program include, but are not limited to the following:

- Functional design through improving the function and performance in clothing for sports, health, safety and protection through innovative solutions.
- Evidence-based human-centred systems design process through the analysis of human factors in functional apparel design.
- Testing and concept validation of solutions for improved apparel performance and function, which is explored through engineering testing, market testing and analysis, user testing and experience, and minimum viable prototyping.
- Generating and evaluating physical prototypes of technical apparel.
- Analyzing business models, leadership practices, and global strategies while considering diverse organizational, social, and cultural relationships within the technical apparel industry. This also includes the research and analysis of sourcing, tariffs, global supply chains, and business strategies.
- Technical apparel Industry knowledge and research.
- Performance textiles knowledge and research.

### *Essential Skills*

A student who successfully completes the Technical Apparel Design program will have been given opportunities to learn and demonstrate the following essential skills:

- Creative thinking and problem-solving skills by appraising and selecting potential solutions to design problems and modifying design solutions to respond to iterative user testing.
- Oral and written communication skills by defending and critiquing opinions in team discussion, composing documented evidence of user research, and writing a succinct proposal for user research that is suitable for ethical review.
- Interpersonal skills through facilitating team discussions and formulating and applying communication strategies to exchange information with others.
- Teamwork skills by collaborating with others as part of a productive team and establishing goals, priorities, and timelines that work toward project completion.
- Leadership skills by initiating and leading a Capstone Project from inception to completion.
- Personal management skills by managing goals, priorities and timelines for project completion.
- Reading and comprehension skills by selecting and evaluating relevant technical information to address design issues of interest.
- Visual literacy skills by interpreting ideas graphically and creating digital presentations.
- Mathematical skills by verifying hypotheses and testing results by calculating statistics.
- Intercultural skills by appraising and advocating user requirements that reflect diversity within the context of technical apparel design; in addition to recommending strategies for engaging users from diverse cultures.
- Technological skills by generating digital presentations, calculations, design, and documentation.
- Presentation skills by producing a succinct and effective oral presentation to a team.

### *Learning Outcomes*

The Technical Apparel Design program learning outcomes include:

- Manage a design project from inception to completion.
- Plan, conduct, and document a comprehensive design process for technical apparel.
- Review research and demographics related to a specified market.
- Formulate design requirements related to users, function and task performance, and the environment in which technical apparel will be used through the application of a human-centered systems approach.
- Evaluate key elements of a human-centered systems approach to the design of technical apparel such as:

- Research and assess key characteristics of technical apparel users,
- Evaluate functions and tasks performed by users of technical apparel,
- Interpret basic principles in psychology and physiology related to sensation, perception, cognition, and emotion,
- Interpret basic principles in kinesiology and functional biomechanics that relate to human performance,
- Predict the effects of thermal physiology & extreme environments on human performance related to technical apparel,
- Select appropriate anthropometric tables and measurements related to fit and range of movement, and
- Assess safety requirements for technical apparel.
- Compose a design proposal that considers and clearly articulates the market opportunity, business strategy, design requirements, and design concept.
- Formulate a clear summary of the business strategy, design process, and technical apparel product:
  - Recommend comprehensive practice-based design research proposals,
  - Evaluate and debate principles of research methodologies,
  - Collect and defend data for accuracy, relevance, and importance in the technical apparel marketplace,
  - Measure leadership skills through development and management of a design research process,
  - Assess viability, feasibility, and desirability of strategic design directions for technical apparel market segments,
  - Evaluate feedback with user groups and industry professionals to establish goals and design objectives,
  - Apply critical thinking and creative problem solving to develop a research proposal,
  - Forecast technological advances and creative solutions for technical apparel and related industries, and
  - Systematize design processes to develop potential concepts for technical apparel market segments.
- Present findings to peers and industry representatives in an organized manner.
- Establish and manage relationships with industry partners and expert collaborators.
- Evaluate existing technical apparel and textiles of relevance to the design intent.
- Appraising aspects of advanced production techniques.
- Generating prototypes through the application of rapid prototyping techniques.
- Translate the proposed design concept to a well-developed, testable prototype or hypothesis.
- Test the proposed design or hypothesis.
- Integrate design feedback into design solutions through an iterative process.
- Present the design project to peers and industry representatives.
- Presenting and disseminating information for an audience.

### *Credential-Level Specifications*

This program requires students to complete a total of 30 credits including a 9-credit Capstone Project. Students are required to complete 12 credits in their first semester during the fall, 9 credits in the spring semester, and 9 credits in their final semester in the fall.

### *Admissions and Prerequisites*

All applicants must meet KPU's undergraduate English proficiency requirement and evidence of successful completion of a recognized Bachelor's Degree, or a design-related Diploma prior to applying. In addition, they must submit an entrance package, which consists of:

- Resume
- Two letters of recommendation, preferably from employers or previous Professors
- Personal statement summarizing their interest in the program

Upon successful review of these items, an interview by the faculty is conducted with the applicant. If the applicant lives in the Greater Vancouver area, an in-person interview is organized. If the applicant lives outside of the Greater Vancouver area, then a videoconference interview is conducted.

## **Student Satisfaction with the Curriculum**

This section of the survey had 15 respondents (see Appendix H: Technical Apparel Student Survey). Of these respondents, 6 were enrolled in the first semester and 9 were enrolled in their third and final semester. 46% of students were very or somewhat satisfied with curriculum, 15% were neither satisfied nor dissatisfied, and 38% were somewhat or very dissatisfied. Even though the majority of students are satisfied with the curriculum, having 38% who are somewhat or very dissatisfied is alarming. Students felt that the program could be improved by providing more emphasis on apparel construction, pattern making, technical drawing (Adobe Illustrator), creating tech packs, and textiles testing. Students also suggested creating an optional internship or co-op program. This is supported by the data in Question 11 (page 39) of Appendix H.

Important responses to note were that 61% of the students were very or somewhat satisfied with the relevance of the program to their career goals and 69% were very or somewhat satisfied with the preparation received to achieve the career they want. Regarding the development of the curriculum, there is a strong interest from students in the offering of a Master's degree in technical apparel; this was displayed when 61% of students noted that they would enroll in a Master's program in Technical Apparel if it were offered.

Regarding the curriculum, it was evident that students felt that the program's strengths include faculty expertise and knowledge, front end analysis, hands on construction and design, industry connections, challenging course matter, and a diverse student body.

## **Faculty Satisfaction with the Curriculum**

Six faculty members responded to this survey for a 100% response rate (see Appendix J: Technical Apparel Faculty Survey). However, it is important to note that currently there are only 4 faculty members. The two other faculty who were surveyed were previous faculty members. It was necessary to include the two additional faculty members to provide anonymity for all respondents.

Faculty are generally satisfied with how the program prepares students for planning and conducting research, explaining the design process, understanding testing methods for proof of concept, and understanding the local/global tech apparel industry. However, only 50% of faculty are satisfied with the amount of preparation in generating and evaluating iterative prototypes. The majority (83%) of faculty are very or somewhat satisfied with the program curriculum overall.

According to the survey results, program strengths include: the success rate of graduates employed in industry, the teaching of the user-centered design process, and the collaborative nature of the program. Faculty members suggest that in order to improve the program, students need more time to learn about apparel construction, patternmaking, prototype development, and tech pack development. We also suggest that the name of the program is changed as it currently limits the scope of people's beliefs about the program. This program is not just about design, as the name implies. In the survey, a student noted that "the program name may be misleading for many people. Very little time is spent on actual design work" (see page 39, Appendix H). Faculty also suggests that an industry internship or co-op should be added and that the program is missing content in pattern drafting, computer applications, and management.

## **Career/Further Education Preparedness**

The Technical Apparel Design program has a high rate of employment in industry upon graduation. For this part of the survey, 78% of alumni that responded were employed in outdoor apparel. Creating a Masters' program has become a reoccurring theme with the respondents and it is important to note that 45% of our alumni said that they would enroll in a Master's Degree program in Technical Apparel and that 100% of alumni would have chosen a Master's Degree over the Post-Baccalaureate Diploma that is currently being offered. The areas that are currently missing from the program include apparel construction, pattern making, tech pack creation, an internship/co-op, and more design skills.

Alumni respondents believed that strengths of the program included:

- User centered design, design research, iterative design;
- Collaborative experience with students and faculty from multi-disciplinary backgrounds;
- Immersion into strategic problem-solving and iterative prototyping;
- Exposure to industry specialists; and

- Off-shore experience to Maxport.

They described that areas for improving the program included:

- More skills in technical drawing, construction, tech packs;
- More opportunities for smaller prototyping projects throughout program;
- Not enough focus on design;
- An internship or co-op would be a very effective way of attaining industry experience as well as putting students in contact with industry partners.

#### *Career Pathways*

Graduates of the program will be prepared to work in a number of areas in apparel and product design and production, with emphasis on technical and high-performance materials. Students may also be interested in industrial design, health care industries and business development and manufacturing. Graduates from the technical apparel design program have gone on to work in industry in roles such as: Materials Development Coordinator, Design Assistant, Freelance Designer, Product Technician, Colour Designer, Marketing manager, Account Manager, Designer, Product Development Assistant, and Sourcing Coordinator.

#### *Alumni Preparedness for Work/Further Education*

Graduates of the program would be prepared to enter into a Master's Degree program, upon successful completion.

#### *Discipline/Sector Feedback*

The survey was sent to 30 members of the discipline/sector and 13 of them responded, for a 43% response rate. The majority (83%) of the respondents have hosted, hired, or worked with Technical Apparel Design students or alumni. Of these, 30% expressed that program alumni/students were very prepared to work in their organization. 60% indicated alumni/students were moderately prepared, and 10% stated they were slightly prepared. This information indicates that the majority of our industry connections believed that our students and alumni were prepared to work in industry.

The majority of respondents indicated that students/alumni must be able to develop iterative prototypes, engage in user centered design strategies, and be able to explain their design process and outcomes. Over 90% indicated that it is very important or essential for program graduates to be able to generate and evaluate iterative prototypes, plan and conduct design research, and understand and engage with the local/global tech apparel industry. 85% indicated that it is very important or essential for program graduates to be able to understand and engage in user-centered design strategies. 75% indicated that it is very important or essential for program graduates to be able to explain their design process and outcomes, and plan, conduct and justify testing methods for proof of concept.

Considering the needs and expectations of their organizations, the degree to which industry respondents indicated these skills were rated as very important or essential were:

- Garment Construction 100%
- User testing/ user experience 83%
- Pattern making 75%
- Functional design 75%
- Technical drawing 66%
- Entrepreneurial skills 59%
- Market testing/analysis 50%
- Engineering testing 34%

Respondents indicated that emerging trends students should be prepared for include sustainability, ethnographic research, empathetic insights, virtual prototyping, AI pattern making, ergonomics, trend research, global influences, trade tariffs, material trends, and on-demand manufacturing. Additional skills, training or knowledge that a program graduate should have in order to be hired include: leadership training, expert knowledge in pattern making and garment construction, understanding of research methods, sourcing, product management, sustainability, team collaboration skills, general business acumen, ability to communicate with offshore suppliers, ability to work independently, and 3D computer design.

To build better connections with industry, there was a consensus that the program should offer a co-op or work internship. Another suggestion was to host working groups to discuss emerging ideas and trends. Additional evidence supporting the development of a Master's program was displayed in that 54% of respondents were very or somewhat likely to recommend a Master's in Technical Apparel to their employees if we were to offer it.

### **Curriculum Development and Review Processes**

Since the Technical Apparel Design program is in its sixth year, it has not had any formal curriculum development review processes. This is an area where more research and formal processes need to be implemented. Curriculum development and review has been conducted informally amongst instructors based on student feedback approximately once per year. Since the studies were conducted in 2018, there have been minor adjustments made to the curriculum based on feedback, but further, more formal revisions still need to be made and will be made part of the curriculum revision plan. Working through the curriculum development and review process that we are currently undergoing with the Program Review will likely increase student satisfaction with the curriculum in the future.

### **Summary and Recommendations**

Students who complete The Technical Apparel Design program receive a post-baccalaureate diploma. Due to survey responses from students and alumni, it has become very clear that there is great interest in transforming this program into a Master's Degree. This would also increase satisfaction for students and alumni and would also increase demand for the program. A pathway for alumni to return to complete their Master's would be necessary as well. The current curriculum needs more emphasis on technical design to

prepare alumni for the industry. It needs to be adjusted to include more instruction on garment construction, patternmaking, and creating specification packs (an information package that designers create to communicate with manufacturers the necessary components to construct a product), which include technical flat drawings (a technical drawing of a garment, as if it were laid flat to show the design details such as seams and stitching). An internship would benefit the program as it would increase industry connections and increase the number of credits, which will result in increased demand from international students.

- The recommendations are based on the stats that follow:
  - 61% of students noted that they would enroll in a Master's program in Technical Apparel if it were offered.
  - 100% of alumni would have chosen a Master's Degree over the Post-Baccalaureate Diploma that is currently being offered.
  - 54% of respondents were very or somewhat likely to recommend a Master's in Technical Apparel to their employees if we were to offer it.
- It is necessary for us to explore the possibility of transforming the Technical Apparel Design Post Baccalaureate Diploma program into a Graduate Diploma or a Master's degree accreditation. If that is not possible, we need to explore the possibility of partnering with Universities who already have the Masters' level accreditation and consider developing a stream that transfers into their program.
- Due to student and alumni recommendations, adjust the curriculum to provide more emphasis on technical apparel construction, pattern making, technical drawing (Adobe Illustrator), tech pack creation, and performance textiles testing. See Question 11, Appendix H: Technical Apparel Student Survey for the data supporting this recommendation.
- Explore changing the name of the program, as Technical Apparel Design suggests that the program is more focused on design than it is. A more accurate program name should be used to ensure that this is not problematic in recruitment for prospective students. See Appendix H (page 39) where a student noted that the name of the program is misleading. Our Advisory Committee has also suggested generalizing the name of the program as our graduates do not go on to work as Designers.
- Based on recommendations from students, faculty, and alumni, add an internship course to the curriculum in order to increase students' relationship with industry. This would also increase credits to support funding and grant eligibility for students.
- Evaluate all learning outcomes to ensure that they reflect what industry needs. If specific outcomes do not reflect these needs, then re-evaluate the curriculum.
- Develop short courses and masterclasses in the field in order to increase possible offerings to explore emerging trends and skill development beyond curriculum. Partnerships with industry to develop such offerings would further increase currency and relevancy.



## **Chapter 4. Quality of Instructional Design**

### **Delivery Modes**

The formal teaching mode in the Course Outlines for all Technical Apparel Design courses in the first semester (DETA 5110, 5120, 5130, 5140) and second semester (DETA 5200, 5210, 5230) is “classroom-related instruction” that involves a combination of lecture, individual and group activities, guests and field trips. The formal teaching mode for the third semester Capstone course (DETA 5300) is a combination of “classroom-related instruction” to guide the class as a group and “individual learning environment” to guide each student’s individual Capstone Project.

In practice, the first and second semester courses are taught in a multi-modal manner that involves lecture, hands-on activities in the labs, self-directed research, field trips, and guest speakers. This multi-modal delivery recognizes the need to deliver new theory (lecture), to learn through synthesis and experience (hands-on activities, self-directed research, and field trips) and to learn through interaction with local industry experts (guest speakers and field trips). Students gain practical knowledge and skills through hands-on activities in the sewing and production labs; through self-directed research related to design context, textiles, production, user experience, and innovation; and through less formal interaction and tours of local industry, including Arc’teryx, Lululemon, MEC, and Mustang Survival.

Delivery is also tailored to the experience and background of the specific cohort in any given year. Students come from diverse backgrounds and bring with them skills and knowledge that can be transferred within the cohort, from student to student, through group activities and a teaching environment that supports collaboration among adult learners. The small cohort and diverse backgrounds are a strength of this program. Student academic backgrounds have included a variety of design disciplines (industrial design, fashion design, interior design), engineering, business/finance, psychology, kinesiology, and sociology. Round-table discussion within the classroom, group assignments and sharing of information among the cohort through online group forums such as Basecamp or Slack provide opportunities for students to support each other and to contribute in meaningful ways to the learning environment, using the knowledge and skills that they bring from prior academic study or employment.

The final semester of the program in which students only take the Capstone course (DETA 5300) has been delivered with the intended modes; however, a “reality learning environment” has been implemented with the third through fifth cohorts. These three cohorts have greatly benefited from an international field trip experience, during which they work onsite with the development team of an advanced technical apparel factory to refine their Capstone Project design and to produce a high-quality prototype sample. The third cohort worked onsite with the development team at Eclat in Taipei, Taiwan. The fourth and fifth cohorts worked onsite with the development team at Maxport Limited Vietnam in Hanoi, Vietnam. The second cohort was the first to benefit from an experiential

international field trip to Maxport Limited Vietnam; however, this occurred earlier in their program and prior to the initiation of their Capstone semester. The addition of the “reality learning environment” mode through international immersion into a technical apparel factory and work with their development team has significantly enhanced the level of learning and the quality of the Capstone outcomes. Our graduates have direct experience working with factory research and development teams that are used by the top technical apparel companies in our local market as well as the global market.

## **Assessment Methods**

All courses utilize a standard letter grade system that is based on multiple assignments and projects throughout the semester, with no single assignment valued at greater than 30% of the final grade. This ensures an opportunity for students to track progress and performance within each course and provides instructors with the information required to initiate additional assistance that may be appropriate to ensure student success in the course and in the program.

The exception to this is the Capstone Project, which is a single assignment that culminates with a final presentation to industry advisors, DETA faculty, and peer students; however, several deliverables are spread throughout the semester with no single deliverable valued at greater than 30% of the final grade. The deliverables are designed to ensure that students’ progress towards a complete Capstone Project within the semester timeline, to provide iterative feedback on their background research, problem definition and solution development, and to prepare them for final presentation to a panel of industry advisors.

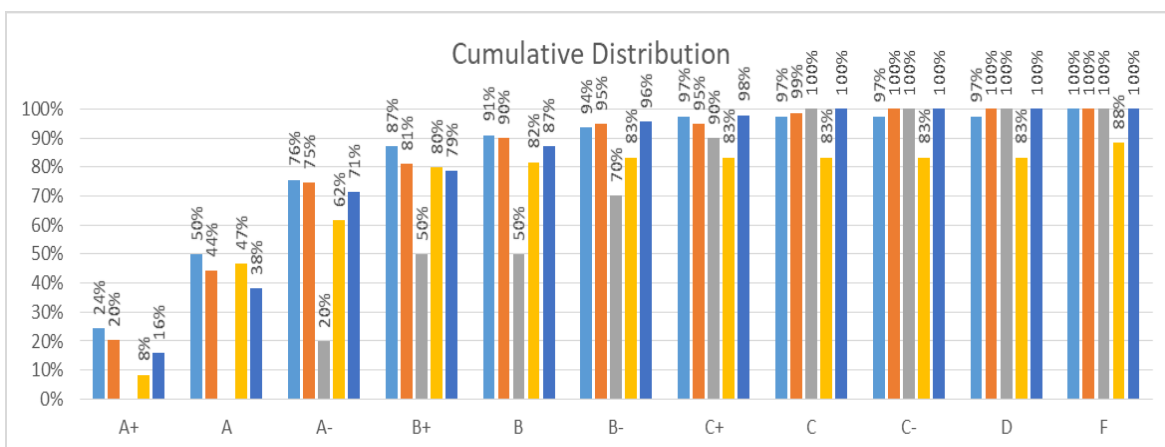
In all courses, students are provided with clear grading rubrics and guidance within the assignment regarding expectations. Feedback on grading is provided for each assignment. Assignments are designed to provide opportunities to apply knowledge within practical technical apparel design contexts that are relevant to the intended outcomes of the course and relevant to the industry requirements for skill and knowledge. The course assignments and content within the first two semesters build the necessary knowledge and skills to support a robust design process within the Capstone Project in the final semester. Feedback and grading provided for assignments during the first two semesters aid in preparing students to successfully implement similar activities within the design process of their Capstone Projects. The Capstone Project provides students with an opportunity to apply each aspect of learning from earlier courses within a unified design process that solidifies the component learning outcomes from the first two semesters.

The teaching faculty within Technical Apparel Design regularly discuss and share insights regarding their experience with each cohort, the progress or concerns related to individual students, and grading strategies for individual assignments. This regular communication aids with promoting consistency in grading strategies and clear expectations for students. The small number of faculty and close proximity within shared office space contributes to consistency in grading and in preparing students for their final Capstone semester.

## Student Experience

### Grade Distribution

Grades within this program tend to be higher than those for the Wilson School of Design, on average. Students within the Technical Apparel Design program have previously completed a minimum of a Bachelor Degree and are in their fifth year of university education. As experienced and successful university graduates, it is reasonable to anticipate a higher level of performance in subsequent undergraduate course work. For the five academic years spanning 2013/14 through 2017/18, only 2016/17 recorded a cumulative grade distribution with fewer than 97% of students achieving a grade of C or better, see Appendix G: Administrative Data Report, Figure 4.1. In all five academic years, 50% or greater of the Technical Apparel Design students achieved a grade of B or better.



Source: Appendix G Administrative Data Report, Figure 4.1: Year upon year cumulative grade distribution of DETA students for academic years 2013/14 through 2017/18.

In the 2017/18 academic year, the last year for which grade statistics are available, students taking courses at a fifth-year level achieved higher mean grades (3.62) and a lower DFW rate (0%) than undergraduate students in years 1 through 4 across the Wilson School of Design.

### Retention and Program Completion Rates

Retention rates and graduation rates for Technical Apparel Design are summarized below. The first four cohorts of the program had retention rates through graduation of 75%, 100%, 75% and 85% respectively. In the first cohort, two of the three students who were not retained left the program during the first year for employment within the technical apparel industry. In the third cohort, one of the two students who were not retained left the program during the first year due to pregnancy. Retention and program completion rates are not of concern for this program.

The table below illustrates the retention and program completion rates of the Technical Apparel Design program. These figures were not pulled from the appendix as they are based on the personal records of Dr. Robinson.

<b>Cohort</b>	<b>2013 (1)</b>	<b>2014 (2)</b>	<b>2015 (3)</b>	<b>2016 (4)</b>
<b>Enrolled Semester 1</b>	12	10	8	13
<b>Completed Year 1</b>	9	10	6	11
<b>Graduated</b>	9 (75%)	10 (100%)	6 (75%)	11 (85%)

#### *Student Outcomes*

Students typically enter the Technical Apparel Design program with an intent to work within this industry upon graduation. Students indicated on the survey (Survey Q5) that the success of previous graduates (100%) and the program’s connection to local industry (92%) were “very important to essential” in their decision to enroll in the program.

The employment rate of graduates in the technical apparel industry within one year after graduation is greater than 90% (82% of Alumni Survey respondents). Many of our students are approached during their final semester to begin employment prior to completion of their Capstone Project. Graduates are currently employed by, or have been employed by 7Mesh, Arc’Teryx, BN3TH, Emergco Aerospace, Kit & Ace, Lululemon, MEC, Mustang Survival, Nachtigall Exploration, RYU, SamSaraSpin and Westcomb. These are all local companies that have direct connection to the design of technical apparel.

#### *Student Satisfaction with Instruction*

Sixty-two percent of students surveyed (Survey Q17) indicated that they were “very or somewhat satisfied” with the instruction that they received in this program, 23% were “neither satisfied nor dissatisfied”, while 15% indicated that they were “somewhat dissatisfied” and 0% indicated that they were “very dissatisfied” with instruction.

Student comments regarding strengths and areas for improvement regarding instruction were outlined in Survey Q18. Strengths tended to focus on high level of instructor knowledge, teaching styles, instructor connection to industry, hands-on prototype construction, and individual learning. Areas for improvement included: improved organization of course and class content, less overlap between courses, and clearer expectations for students.

These strengths and weaknesses are, for the most part, valid critiques of the program if one keeps the timeline of the last five years in mind. This program is relatively new, with the fifth cohort finishing their Capstone semester in December 2019. As such, the instructional styles and content evolved rapidly in the first few years of the program, with changes to who is instructing, content of instruction, style of delivery and to specific assignments and activities to more effectively provoke learning. As we are just completing

instruction for the fifth cohort, there is a sense among faculty that the curriculum and instruction are stabilizing such that courses are increasingly complementary of each other and more effectively prepare students for Capstone and for employment after graduation. Comments received within the student survey include the experience of students within the first couple of years that the program was delivered. It is reasonable that students from the earlier years may have identified many of the areas for improvement that faculty have already acted upon in iterations of each course.

## **Faculty Experience**

### *Expertise and Qualifications*

Technical Apparel has four faculty members: Dan Robinson, Evelyn May, Stephanie Phillips, and Emily Heaps. Dan Robinson is a Canadian Certified Professional Ergonomist (CCPE), Past-President and Fellow of the Association of Canadian Ergonomists, Member of the Human Factors and Ergonomics Society, registered as a Practicing Kinesiologist with the BC Association of Kinesiologists. He has been consulting in Ergonomics for more than 25 years with an active practice as Robinson Ergonomics Inc. His education includes M.Sc. and Ph.D. in Kinesiology from Simon Fraser University. Evelyn May is a hybrid thinker with the ability to strategically synthesize current research with future trends in technical apparel. She is a graduate of Thomas Jefferson University with an MBA in Strategic Design. Stephanie Phillips graduated with a Masters of Art in Textile Futures from Central Saint Martin's College & Design with the focus of material sustainability. Her design research practices focus on the development of functional composite textiles for a single waste stream, focusing on bio-derived material sources. Emily Heaps is the Coordinator of the Technical Apparel Design program and currently serves as the Chair of the Board for Our Social Fabric and President of the Wilson School of Design Alumni Association. She consults for a number of local apparel companies, specializing in product and business development. She has a B. Des. Fashion & Technology from KPU and an MBA from Simon Fraser University. Full biographies of all faculty can be found in Appendix E.

### *Faculty Satisfaction with Instruction*

Faculty indicated that 83% were “very or somewhat satisfied” with instruction delivered across the program and one faculty was “neither satisfied nor dissatisfied” (Faculty Survey Q12). In clarifying strengths and opportunities for improvement (Faculty Survey Q13), the small cohort, lab collaborations, and consistent messaging across courses were perceived as strengths, while improvement could be made by adding earlier and more garment construction content, adding engineering test methods, clarifying where duplication may be occurring and providing more “real life examples”. It isn't clear exactly what was meant by real life examples; however, this could be interpreted as more case studies from industry-based design projects.

There appears to be a general consensus among faculty that instruction is strong, but there is room for improvement in content to enhance hard skills (garment construction; engineering tests) and to provide streamline content between courses. There were no

significant comments provided regarding the modes of delivery or the methods of assessment that are applied during instruction.

## **Summary and Recommendations**

A variety of delivery modes are used to teach this program, including lectures, group activities, guests, and field trips. The Capstone Project course is the only course in the program where one assignment is worth more than 30% of the students' grade. On average, students within tech apparel have higher grades than those in the Wilson School of Design. Students enter our program with an intent to work in the industry upon graduation, so our retention and graduation rates are high (75% in 2013, 100% in 2014, 75% in 2015, and 85% in 2016). The majority of students are satisfied with the level of instruction offered in the program. This was demonstrated when 62% of them responded that they were very or somewhat satisfied with the instruction in the student survey. The majority of faculty are satisfied as well, as 83% responded that they were very or somewhat satisfied with the instruction delivered in the program. Below are a number of recommendations that should be taken into consideration, based on our findings:

- Add additional teachings and/or courses earlier in the program for technical apparel garment construction, line drawing, and engineering test methods.
- Determine where duplication across courses exists; remove it. Develop a mechanism for course content and outcome sharing across the faculty.
- Add case studies to appropriate courses to provide students with more real-life examples.
- Develop a formal partnership with industry for critiques throughout the curriculum.
- Formalize the Annual budget to support key events that are not included in tuition classes. Examples include orientation weekend, international field experience (currently funded by the Wilson Vision Execution Fund), grad events (final presentation to industry and public show), alumni events, and speaker panel events, as these activities contribute to the overall success of our students.

## **Chapter 5. Quality of Services, Resources, and Facilities**

### **Description of Program Resources, Services and Facilities**

The administrative and support services upon which the program depends include the Learning Centre, Advising, Counseling Services, Registration, Student Awards & Financial Assistance, and Career Services. Students who are struggling throughout their courses are always recommended by faculty to attend the Learning Center for assistance with assignments. Advising is not used frequently by Technical Apparel Design students because we are a cohort-based program, therefore students are given their course plan for the duration of the program and rarely deviate from the standard course plan. Counseling services are recommended to students in distress. Registration assists applicants throughout the application process and then at the beginning of every semester with registration. Students who inquire about financial help are directed to Student Awards & Financial Assistance. Career services could be used more towards the end of our program, when students are starting their job search.

The facilities upon which the Technical Apparel Design program depends includes space throughout the Wilson School of Design, specifically the classrooms, the lab space, and the individual and group workspaces on campus. The classrooms and lab spaces are well designed and flexible for the various teaching methods used throughout our program. There are many options for students to work on campus on individual projects or as groups.

### **Student Satisfaction with Program Resources, Services and Facilities**

There was an 83% response rate on the student survey with 15 of the 18 students answering questions. On the student survey, there were four questions that addressed the student's satisfaction with program resources, services, and facilities; these included questions 19 to 22. This section had 13 respondents to each question, as 2 students skipped this section. All data for this section can be found in Appendix H: Technical Apparel Student Survey.

Question 19 asked students their level of satisfaction when it came to the availability of required texts, classroom space, lab space, the Learning Centre, places to do group or individual work, support services, and technical equipment. 9 or more of the 13 respondents stated they were either somewhat satisfied or very satisfied with the following: availability of required texts at the bookstore, classroom space, lab/computer space, places to work, and technical equipment. The majority of students stated that they were neither satisfied or dissatisfied with the learning center and support services. This can be improved by teaching students in the first semester what is offered to them and how they can use the services.

Regarding survey question 20 of the student survey, where they were asked how satisfied they were with the library resources that were available to them, zero students answered that they were very dissatisfied or somewhat dissatisfied with any of the listed resources.

The strengths listed in resources, services, and facilities included “labs and classes are well designed and equipped” and “the facilities and access to equipment is amazing.” Students praised the new building which we moved into January 2017. Where students were asked for areas for improvement, four students mentioned that the notions should be divided by program as there were issues with students from other programs hoarding technical apparel related notions, such as zippers.

Regarding survey question 21 (how satisfied are you with the resources, services, and facilities offered through KPU’s Technical Apparel Program?), 92% responded with very or somewhat satisfied. However, the following survey question asked students “thinking of the program’s resources, services and facilities, please highlight the following strengths and areas for improvement.” Two respondents answered with suggestions to have longer lab hours.

### **Faculty Satisfaction with Program Resources, Services and Facilities**

Overall, faculty are satisfied with the program resources from a design and making standpoint. Sewing facilities outside of class times need to be addressed as students require further support than what is currently being provided. This can be in the form of a lab technician who is knowledgeable with the equipment, procedures, and materials testing. Faculty believes that the program requires additional testing equipment that is used specifically within the technical apparel industry. A Sweating Guarded Hotplate is necessary to measure thermal properties and water vapor permeability. In addition, a Rain Tester is required to measure water repellency of textiles in a variety of wet conditions. This equipment is necessary due to the nature of our students’ work and they need further abilities to verify the efficacy of their textiles for their design solutions. It is possible to partner with another department at KPU to submit a joint capital request for these resources. More research needs to go into assessing which would be an appropriate department to partner with.

### **Summary and Recommendations**

In conclusion, students are satisfied with the program’s resources, services, and facilities. They feel supported enough to successfully complete our program. This does not come as a surprise as the program is taught in the Wilson School of Design, which was built in 2017. Faculty feel that it is necessary to purchase more testing equipment to expose the students to more textiles testing. This would benefit not only students in the technical apparel program but also students in the fashion design and product design programs.

- Determine whether there are other faculties at KPU who could use a Sweating Guarded Heatplate and/or a Rain Tester. Submit a joint capital request for this testing equipment.
- At the start of each new cohort, teach students about the administrative and support services that they have access to, which include the Learning Centre,



Advising, Counseling Services, Registration, Student Awards & Financial Assistance, and Career Services.

- Based on the feedback from student surveys in Appendix I, explore whether it is possible to extend lab hours for students at the Wilson School of Design.
- Explore the possibility of an additional lab technician to support engineering testing and increased production capabilities.

## **Chapter 6. Conclusions and Recommendations**

### **Summary of Conclusions**

#### *Strengths*

This program has many strengths and it is poised for growth as Vancouver is expected to be the Technical Apparel capital of the world. It will continue to grow and improve the KPU's reputation. Our most notable strength is our potential to become the best technical apparel program in what is destined to be the technical apparel centre of the world. Other strengths worth noting are our strong industry connections, increasing student demand, high curriculum satisfaction, and high graduation rates.

#### *Areas Needing Improvement*

The Technical Apparel Design program is doing well considering it is still a relatively new program, but there are always areas in which we can improve. We have a strong connection to industry, but we need to strengthen our ties by adding more members to our Advisory Committee. It is imperative that the length of this program is increased by adding a co-op or internship at the end of the curriculum. This will increase the demand for the program from both domestic and international students as it will strengthen our industry connections. As advised by KPU International, it will increase international demand for the program as graduates will be able to apply for longer Post Graduate Work Permits (PGWP) if the program is two years. Student demand is already increasing, but we need to continue to increase program awareness across Canada through social media campaigns that use notable industry figures.

### **List of Recommendations**

#### *Short Term (less than 6 months)*

- Conduct research to determine how the Technical Apparel Design program can create stronger connections with the Fashion Design & Technology program at the Wilson School of Design, the KPU School of Business, and the KPU Faculty of Science and Horticulture to develop more mutually beneficial relationships.
- Recruit two representatives, preferably in design or product development from Lululemon Athletica to join our Technical Apparel Design Advisory Committee.
- Recruit one to two representatives who work at a technical apparel company in the Human Resources field to join our Technical Apparel Design Advisory Committee.
- Determine whether there are other faculties at KPU who could use a Sweating Guarded Heatplate and/or a Rain Tester. Submit a joint capital request for this testing equipment.
- Explore the possibility of extending lab hours for students and hiring an additional lab technician to support engineering testing and increased production capabilities of the students, based on data in Appendix H: Technical Apparel Student Survey.

- Determine where duplication across courses exists; remove it. Develop a mechanism for course content and outcome sharing across faculty.
- Add case studies to appropriate courses to provide students with more real-life examples.
- Develop a formal partnership with industry for critiques throughout the curriculum.
- Increase the length of the program to two years, which includes an internship and/or co-op at the end of the program.
- At the start of each new cohort, teach students about the administrative and support services that they have access to, which include the Learning Centre, Advising, Counseling Services, Registration, Student Awards & Financial Assistance, and Career Services.

*Mid Term (6 months to 2 years)*

- Create a formal program articulation and credential recognition process for potential new applicants who would like to have transfer credits.
- Increase program awareness through developing a social media strategy, using notable industry figures and the future of the local technical apparel industry.
- Based on recommendations from students, faculty, alumni, and KPU International, add a co-op and/or internship course to the curriculum in order to increase students' relationship with industry. This would also increase credits to support funding and grant eligibility for students, which would result in attracting more domestic and international students.
- Assess how materials and notions are distributed for technical apparel design students. Determine a feasible way to ensure students are not hoarding supplies.
- Formalize the annual budget to support key events that are not included in tuition classes. Examples include orientation weekend, international field experience, grad events (final presentation to industry and public show), alumni events, and speaker panel events. These activities contribute greatly to the overall success of our students and program.
- Explore changing the name of the program, as Technical Apparel Design suggests that the program is more focused on design than it is. Once the curriculum changes are made, a more accurate title should be given to the program to ensure that this is not problematic in recruitment for prospective students from the apparel industry. This came as a suggestion from our Advisory Committee.
- Explore the possibility of transforming the Technical Apparel Design program into a Master's degree. If the Master's degree option is not feasible, then develop an upgraded certification to Graduate certificate to further enhance the offering or partner with an institution that already offers a Master's program and create a laddering system to their Master's program.

*Long Term (over 2 years)*

- Add additional teachings and/or courses earlier in the program for technical apparel garment construction, line drawing, and engineering test methods.

- Due to student and alumni recommendations, adjust the curriculum to provide more emphasis on technical apparel construction, pattern making, technical drawing (Adobe Illustrator), tech pack creation, and performance textiles testing.
- Evaluate all learning outcomes to ensure that they reflect what industry needs. If specific outcomes do not reflect these needs, then re-evaluate the curriculum.
- Develop short courses and masterclasses in the field in order to increase possible offerings to explore emerging trends and skill development beyond curriculum. Partnerships with industry to develop such offerings would further increase their relevance.

## **Chapter 7. Responses from the Dean/Associate Dean**

### **Program Overview**

#### **What do you see as the program's greatest accomplishments over the last 5 years?**

The Technical Apparel Program is gaining recognition as a distinct educational experience with course offerings that are specifically unique within Canada. The program has a solid focus on performance-based solutions, human-centered design and strong ties with industry through an actively engaged Advisory Committee. Additional collaborative efforts with industry partners via international field experiences, iterative project feedback, mentorship and guest speakers provide further alignment with our polytechnic, experiential approach to learning. The students come from a range of diverse educational and professional backgrounds that further enhance the learning environment of this post baccalaureate level of coursework. Alumni are being recognized with design awards and are successfully working and advancing within well established companies within the technical apparel industry.

#### **Does the program adequately fulfill the purpose for which it was intended? If not, how can it be improved?**

Yes, the program is adequately preparing students to work within the field of technical apparel and is providing valuable opportunities to work directly with members of industry. In order to further prepare our students, some noted areas of improvement include deepening the level of engagement with industry through internships and/or co-op placements and enhancement to curriculum to include more focus on some well identified technical aspects such as prototyping, garment construction, technical drawing and specification packages.

#### **How does the program's curriculum support the following?**

- graduates' pursuit of meaningful employment and further education
- the viability and continued development of the program

The curriculum has a solid concentration on user-centered design with a hands-on, industry specific approach to problem solving. Further enhancement to curriculum as mentioned in the section above will be considered within proposed program revisions and a thorough investigation will look into the possibilities of extending the program with additional credits to cover co-op opportunities. Additional considerations will also include the possible expansion into a graduate certificate/diploma or a Master's program or alignment with an institution with a comparable program offering.

**What challenges and opportunities for growth should the program consider based on the following?**

- student demand (past, present and future)
- comparable programs at competing institutions
- trends and changing contexts in the discipline/sector

The current data has indicated that student demand is on the rise and the program is committed to ongoing analysis on strategic enrolment planning to monitor student numbers and to assess the appropriate review process for entrance requirements. This also includes further focus on the development on strengthening pathways for advanced entry students via transfer credit and/or recognition of prior learning. Increased promotion on the awareness of career opportunities within the technical apparel industry and highlighted alumni success stories will also support attracting student prospects. More collaboration with the Future Students' Office Team will also assist to assess plans to strategically target venues to reach a suitable market that is more mature and gravitates towards a distinct career aspiration and lifestyle.

Although the program currently does not have any direct local competitors, the team will still need to closely observe the direction of other institutions on a global scale and to ensure that we continue to highlight our unique value proposition. This also includes a nimble and flexible approach to address future trends and drivers for change such as sustainability, advancement in technology (such as virtual prototyping) and global influences in sourcing and manufacturing.

**What plans (departmental, faculty and institutional) are in place for program growth and development?**

The program will move forward with revisions in curriculum to further integrate development in the areas of technical skills such as garment construction, pattern making and specification packages to support the valuable process of rapid prototyping within the iterative design process. This will include the reassessment of all course outlines and learning outcomes to ensure the appropriate balance of theory, research and experiential learning activities to continue to support the focus on human-centred design and performance solutions. Additional investigation will also begin on the expansion of the credential to include a co-op/internship option and possible elevation to a graduate certificate/diploma and/or a Master's degree.

Further areas of advancement also include increased engagement with industry and alumni to maintain currency and to continue to build the brand and reputation of WSD and KPU. The program will also seek additional opportunities to develop workshops and short courses with micro-credentials for alumni and other members of industry to maintain connections and for revenue generation potential.

**What resources, institutional support, and/or external support would help address the program's plans for growth and development?**

The proposed curricular changes will require administrative support for program and course outline revisions through the Curriculum Committee process. This will include both the Faculty and Senate level committees and the Provost Office for Ministry related approvals. Further considerations for the elevation of the credential will also require detailed consultation with the Office of Graduate Studies.

Any proposed workshop and short course offerings will require the guidance and collaboration from the Teaching and Learning team under the Continuing and Professional Studies framework. On-going feedback from the Advisory Committee will be critical to maintain currency, relevancy and experiential learning opportunities.

For recruitment, this includes continued collaboration with the Future Students' Office (FSO) team for targeted venues to reach this specific market and with Marketing to highlight alumni success stories.

Another strength of the program is the International Field Experience that provides the capstone opportunity to travel to an offshore factory to work with a product development team. This particular aspect is an essential component of this program and we are grateful to the support of Chip and Shannon Wilson for providing the initial funding. The team will investigate additional avenues to ensure that this level of experiential learning will remain within the program through such considerations as local industry partnerships and/or integration of a field school component within curriculum.

**Collectively, what qualifications and other human resources are required so the program will be able to make the changes required to improve and remain current?**

In addition to the resources noted in the section above, faculty will need continued support for professional development and research opportunities to enhance teaching practices and to continue to build upon the program's value proposition. The program will also need to consider expanding the Qualified Faculty Listing to prepare for future shifts in the level of credential. Additional industry team members can also be considered for the workshops and short courses under the Continuing and Professional Studies framework.

As the overall usage of lab/testing spaces, specialized equipment and technology increases for all students within the Wilson School of Design, the need for additional support and training for qualified technicians is also required.

**What areas should the program focus on for the short range (< 6 months), mid-range (6 mo. – 2 years), and long range (>2 years) program directions and improvement?**

We are in full support of the program's priorities as described in Chapter 6 on pages 33-35 in this study. Some of the proposed areas of improvement may span over all three time categories due to the nature of the curriculum process and the approval timelines. It will be critical to maintain open lines of communication with the Advisory Committee to ensure that the direction is in alignment with industry standards and that the framework development is able to easily accommodate new shifts in technology and globalization.

## **External Connections and Support**

**How could the program improve its connections with external groups (e.g. the discipline/sector, high schools, alumni, professional associations, other institutions)?**

As noted in the section above, the support to continue a strong connection with the Advisory Committee is a major factor in the program's progression. This will also include further engagement with the newly established BC Apparel and Gear Association, the Apparel Camp network and other related professional associations. Additional support is needed to through the re-initiation of the Wilson School of Design Alumni Association and the establishment of an on-line network and scheduled events further engage with alumni.

## **Final Comments**

**What else do you think is important to add about the program that is not covered in the previous questions?**

We commend the Technical Apparel Design Program team for their passion and commitment to elevate this program and to educate the next global leaders in the technical apparel industry. The program is primed to respond to the growth in this sector and the Wilson School of Design is well situated within this dynamic technical apparel design hub. In addition to the appreciation we have for our Advisory Committee members, we are also grateful for the valuable support of Chip and Shannon Wilson. We look forward to further collaboration with the Wilsons as their recent acquisition of Amer Sports, a sporting goods company that includes internationally-recognized brands such as Salomon, Arc'teryx, Peak Performance, Atomic, Suunto, Wilson Sports and Precor, has further highlighted the need to produce high quality graduates who are prepared to work in the field of high performance technical apparel.



## **Chapter 8. Appendices for Self-Study Report**

Provided in separate document.