SC 102: Knitwear Design & programming

Course Duration: 17 Weeks (4 months)

Sessions per Week: 3 (3.5 hours each)

Total Hours: 180

Course Objectives:

- Understand the fundamentals of denim fabric and its properties.
- Learn various denim washing, dyeing, and finishing techniques.
- Develop practical skills in applying these techniques.
- Understand environmental and sustainability considerations in denim processing..

Week	Session No	Session Title	Detailed Topics	Key Learning Methods
1	1	Introduction to SDS-One APEX and Knitwear Design Basics	• Overview of computerized knitwear design and industry applications. • • Introduction to SDS-One APEX system components and interface.	• Lecture • Discussion • Q&A • Practical
	2		• Fundamental concepts of knitwear: yarn types, fabric structures, and stitches. • File management on SDS-One APEX (saving, importing, exporting designs).	
	3		• Hands-on practice: Navigating the interface and basic tool usage. • • Sketching simple motifs and exploring design templates.	
2	4	Knitwear Design Workflow	• Understanding the workflow: Concept, design, and programming. • • Exploring 2D and 3D visualization tools in SDS-One APEX.	• Lecture • Discussion • Q&A • Practical
	5		• Introduction to gauge and tension settings. • Fundamentals of pattern repeat and scaling.	
	6		• Practical exercise: Creating basic swatches and visualizing them in 3D.	
3	7	Creating Patterns and Motifs	• Basics of designing jacquard, intarsia, and cable patterns. • Introduction to SDS-One APEX's motif library.	• Lecture • Discussion • Q&A • Practical
	8		• Editing and customizing existing motifs. • • Designing symmetrical patterns using APEX tools.	

Week	Session No	Session Title	Detailed Topics	Key Learning Methods
	9		• Hands-on: Developing original motifs with a focus on creativity and precision.	
4	10	Color and Texture Application	• Understanding color theory in knitwear. • • Working with color palettes and libraries in SDS-One APEX.	• Lecture • Discussion • Q&A • Practical
	11		• Applying colors and textures to designs. • • Exploring shading, gradients, and effects.	
	12		• Practical session: Designing multicolored knitwear patterns.	
5	13	Advanced Pattern Creation	• Creating complex knit structures: Aran, lace, and ribbing. • Working with dynamic patterning tools in SDS-One APEX.	• Lecture • Discussion • Q&A • Practical
	14		• Adjusting tension maps for advanced patterns. • Adding embellishments and trims to designs.	
	15		• Practical project: Designing a custom knitwear piece.	
6	16	Garment Design and Prototyping	• Basics of garment construction: Sweaters, cardigans, and accessories. • Integrating patterns into garment templates.	• Lecture • Discussion • Q&A • Practical
	17		• Customizing fit and shaping using SDS-One APEX's tools. • Working with neckline, sleeves, and hem variations.	
	18		• Hands-on: Designing a complete garment in 2D and visualizing it in 3D.	
7	19	Programming for Knitwear Production	• Introduction to knitwear machine programming. • Exporting designs for compatibility with Shima Seiki knitting machines.	• Lecture • Discussion • Q&A • Practical
	20		• Understanding programming codes and instructions. • Adjusting designs for machine-specific requirements.	
	21		• Practical exercise: Translating a design into machine code.	

Week	Session No	Session Title	Detailed Topics	Key Learning Methods
8	22	**Capstone Project Part 1 – Design and Development**	• Over these weeks, students will design and develop a knitwear project from scratch. 1. Tasks include: 2. Conceptualizing a design. 3. Creating patterns and motifs. 4. Visualizing the design in 2D and 3D. 5. Programming the design for production.	• Lecture • Discussion • Q&A • Practical
	23			
	24			
9	25			
	26			
	27			
10	28			
	29			
	30			
11	31	Advanced Techniques in Knitwear Programming	• Exploring advanced programming features of SDS-One APEX. • Troubleshooting common design and programming issues.	• Lecture • Discussion • Q&A • Practical
	32		• Simulating knit production for error detection.	
	33		• Hands-on: Refining machine-ready designs.	
12	34	Knitwear Production and Testing	• Overview of knitwear production processes. • Testing and quality assurance for knit samples.	• Lecture • Discussion • Q&A • Practical
	35		• Adjusting designs based on production feedback.	
	36		• Practical: Producing test samples from designs.	
13	37	**Capstone Project Part 2 – Production and Presentation**	• Finalizing designs and preparing machine-ready files. • Producing and troubleshooting sample garments.	• Lecture • Discussion • Q&A • Practical
	38			

Week	Session No	Session Title	Detailed Topics	Key Learning Methods
	39		• Presenting the final knitwear project, including design and technical documentation.	
14	40			
	41			
	42			
15	43			
	44			
	45			
16	46	Industry Connections and Career Preparation	• Session 1: Portfolio Development • Assembling a professional portfolio.	• Lecture • Discussion • Q&A
	47		• Career Pathways in Knitwear • Job roles, freelancing, and entrepreneurship.	
	48		• Networking and Industry Trends • Guest lecture or panel discussion with industry experts.	
17	49	Course Review and Final Assessment	• Recap of major topics covered during the course. • Q&A session for clarifying doubts.	• Lecture • Discussion • Q&A
	50			
	51		• Course wrap-up, feedback session	

Assessment Components:

- Weekly Assignments: 10%
- Capstone Project: Part 1: 40%
- Capstone Project: Part 2: 40%
- Class Participation: 10%