

## MATERIALS DEVELOPMENT – ATD381

Instructor:	e-mail:
	Term:
Voice mail:	Total class hours: 36
Office hours:	Class meets:

**Course description:** The development of products from textile and fibrous materials is a critical component of new product development in many industries, including textiles and apparel. This course provides the technical information required to understand how fiber-based products are manufactured, with a practical view of how to combine new elements such as polymers, dyes, ceramics and nanotechnology with fibers for unique new product development. Provides hands-on exercises and demonstrations of key textile and fiber-based products are manufactured.

**Course objectives:** Upon completion of this course the student will be able to:

- Use the Internet for research into design, materials and industry trends.
- Collect sources to be used as inspiration for developing new materials, trims and designs.
- Use appropriate terms and technology when creating designs for apparel.
- Apply knowledge of material construction and properties.
- Develop material design skills in Adobe Photoshop/Illustrator/InDesign
- Perform techniques such as image and color manipulation.
- Apply advanced technical materials and textile knowledge, including fibers, yarns, knit and woven fabrications, textile manufacturing, dyeing, finishing to a final product.
- Demonstrate knowledge of product creation process and its practical and cost-effective application to the apparel business.
- Work with a materials vendor to develop a material from inception to actual production.

**Competencies assessed:**

- Generate designs that take into consideration practical details plus ecological, environmental, sociological, psychological, technical and economic trends and issues.

**Class format:** Class time is divided between lecture, research and lab work.

**Prerequisites:** Textiles (AD169), Color Theory (AD114)

**Recommended texts:**

- *Apparel Manufacturing Technology*; T. Karthik, P. Ganesan, D. Gopalakrishnan; CRC Press; ISBN9781498763752
- *Materials and Technology for Sportswear and Performance Apparel*; Steven George Hayes, Praburaj Venkatraman; CRC Press; ISBN 9781482220506

**Required supplemental materials:**

- Laptop loaded with Adobe CS4 or higher.
- Sketchbook
- Note book, pens and other classroom supplies.
- Computer USB drive – Minimum 1GB

**Standards of conduct: Complete and on-time attendance is mandatory.**

- **No student can miss three or more classes and expect to pass this class.**

- Attendance is at the beginning of each class period. If you are late, you will lose half the attendance points for the day. If you arrive late, it is your responsibility to make sure you have been counted present. If you arrive more than 15 minutes after the beginning of a part of the class period, you will be counted absent for that part of the period.
- If you are absent, you lose the attendance points for that day. If you know ahead of time that you will not be in class, make arrangement with the instructor the night *before* class (by 10 p.m. and by telephone).
- It is the student's responsibility to keep track of assignments and turn them in on time should the students miss the class or arrive late.
- Professionalism means: Turn off your cell phone. Attend the full class. Focus and follow-through during classroom work. Have respect and work well with classmates. Use the same behavior in the classroom as you would on the job in the apparel industry.
- Late work will result in a one letter grade deduction.

**Labeling Policy:** All student work must be turned in with the following information: Name, Course Name/Number, Instructor, Term/Date, Project/Assignment, Contact Info (phone or e-mail). Work may not be accepted for full credit without the required information. PFI cannot guarantee the return of student work that is not labeled with the required information.

**Incomplete:** A student who, due to medical or other exceptional causes, cannot complete the required class work must document his/her situation and submit a written request for an incomplete grade to be entered. The instructor, the academic advisor and director must approve the grade and assign a time line for the work to be completed. Incompletes must be requested and approved no later than the end of the quarter for which the incomplete is requested. To remove an incomplete, a student must complete the required course work before the next quarter commences. If a student does not comply within the time line or does not complete the work, an "F" grade, or the grade calculated by the instructor on the incomplete form, will be entered to replace the incomplete.

To initiate a request for an incomplete grade, the student must fill out an incomplete form and submit it to his/her instructor. The instructor will obtain the required signatures and submit the completed form with final grades.

**Withdrawal (W/WF):** The student who withdraws from a course or from the program during the first six weeks of the quarter will be assigned a "W" code for each course. The "W" code is not used in computation of the student's grade point average; however, "W" credits are counted toward total credits attempted. The student who withdraws from a course or from the program after the ninth week of the quarter will be assigned a "WF" code for each course. The "WF" code is the equivalent of a grade of "F" and is used in computing the student's grade point average.

Students wishing to withdraw from PFI must file an official status change form with the Academic Advisor.

Last day to withdraw from the class is 48 hours before class starts.

**Lab Policies:** Leave food and drink outside the classroom. Disciplinary action will be taken toward any student found using the equipment in an inappropriate manner. Disruptive, disrespectful, rude behavior is not tolerated.

**Plagiarism:** Presenting the writings, images or paraphrased ideas of another as one's own, is strictly prohibited. Properly documented excerpts from other's works, when they

are limited to an appropriate amount of the total length of a student's paper, are permissible when used to support a researched argument.

**Attendance Policy:** Students who are absent from all scheduled classes over a 14-day period (2 weeks) are subject to automatic attendance suspension—from PFI, not just from this course. This means the student is administratively withdrawn from all courses and cannot attend classes or continue in the current quarter unless he/she successfully appeals for reinstatement. Students who anticipate violating the attendance policy should contact the academic advisor immediately to discuss options such as withdrawing from PFI or navigating the appeals process.

**Picking up Work:** Please pick up your work no later than the first Friday of the following quarter. If you cannot retrieve your work by this date please make arrangements with me. All work not picked up by this date will be recycled.

**Students with Disabilities:** It is PFI policy not to discriminate against qualified students with a documented disability in its educational programs, activities or services. If you have a disability-related need for adjustments contact the academic advisor.

**Evaluation:**

Attendance/Professionalism/Participation	10 %
Assignments #1-#7	70 %
Final project #6	20 %
<b>TOTAL</b>	<b>100 %</b>

**Grade Scale**

Letter	Number	Rating
A	95-100	Excellent
A-	90-94	
B+	87-89	Good
B	83-86	
B-	80-82	
C+	77-79	Satisfactory
C	73-76	Fair
C-	70-72	
D+	67-69	Marginal
D	62-66	
F	<62	Failure

**COURSE CALENDAR**

This syllabus is subject to change at the instructor's discretion.

WEEK	TOPIC	ACTIVITY	ASSIGNMENTS
1/	Introductions. Terminology. Process. Goals and Objectives.	<b>Bring supplies to every class.</b> <b>LECTURE &amp; DEMO</b> Yarn processing & classification <b>CLASSWORK</b> Materials classification & properties	Assignment #1A - Materials classification & properties
2/	Review AD169	<b>LECTURE:</b> Properties and Performance of Textiles: Functional and aesthetic requirements	Assignment #1B - Materials functional & aesthetic requirements
3/	Review AD114	<b>LECTURE</b> Principles of coloration for specific end-uses	Assignment #1C – Coloration choices in materials for assigned end use
4/	Apparel materials	<b>LECTURE:</b> Properties and Performance of Textiles: End-use applications, apparel <b>LAB:</b> Materials for apparel: properties and performance	Assignment #2 - Materials for apparel: properties and performance
5/	Outerwear materials	<b>LECTURE:</b>	Assignment #3 - Materials for

		Properties and Performance of Textiles: End-use applications, outerwear <b>LAB:</b> <b>LAB:</b> Materials for outerwear: properties	outerwear: properties and performance
6/	Activewear materials	<b>LECTURE:</b> Properties and Performance of Textiles: End-use applications, activewear <b>LAB:</b> Materials for activewear: properties and performance	Assignment #4 - Materials for activewear: properties and performance
7/	Footwear materials	<b>PRESENTATIONS:</b> Properties and Performance of Textiles: End-use applications, footwear <b>LAB:</b> Materials for footwear: properties and performance	Assignment #5 - Materials for footwear: properties and performance
8/	Manufacturing equipment for apparel/activewear	<b>LECTURE:</b> Manufacturing techniques and equipment for specific end-uses: Apparel <b>LAB:</b> Tour local production house	Assignment #6 – Trend research on apparel manufacturing and equipment for apparel
9/	Manufacturing equipment for footwear	<b>LECTURE:</b> Manufacturing techniques and equipment for specific end-uses: Footwear <b>LAB:</b> Tour local production house	Assignment #5 – Trend research on apparel manufacturing and equipment for footwear
10/	Innovations and emerging technologies	<b>LECTURE:</b> Emerging technologies: Polymers, dyes, ceramics and nanotechnology. Summary discussion: Process of design, development and practical application of a new material <b>LAB:</b> Begin work on final project: Design and prototype of a materials project	Assignment #7 –Research on chosen technology and how it will be used in final project
11/	Environmental and ethical issues	<b>LECTURE:</b> Materials technology and environmental sustainability <b>LAB:</b> Continue work on final project: Design and prototype of a materials project	<b>Work on final project</b>
12/	Final review	<b>PRESENTATIONS:</b> Final project presentation.	<b>Materials reviewed and returned by end of class</b>