

**VIVEKANANDHA**  
**COLLEGE OF ARTS AND SCIENCES FOR WOMEN**  
**(AUTONOMOUS)**

(An ISO 9001:2008 Certified Institution)

Affiliated to Periyar University, Approved by AICTE,

Re-accredited with 'A' Grade by NAAC, Recognized

u/s 2f & 12(B) of UGC Act, 1956

Elayampalayam, Tiruchengode, Namakkal (Dt.)

**DEPARTMENT OF TEXTILE AND FASHION DESIGNING**



**B.Sc.**

**(TEXTILE AND FASHION DESIGNING)**

**OUTCOME BASED SYLLABUS**

**(2021 - 2022)**

**VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN**

(AUTONOMOUS)  
**TFD**  
**(BACHALOR OF TEXTILE AND FASHION DESIGNING)**  
(Candidates admitted from 2021-2022 onwards)

**REGULATIONS**

**I. SCOPE OF THE PROGRAMME**

B.Sc. (Textile and Fashion Designing) is a three-year Undergraduate degree program that helps the student to develop an understanding of the fashion environment and trains them to develop a range of fashion products for a targeted market segment. It also includes latest trends, cultural dynamics, and innovations in the Indian and International fashion industry. Wanting become a Fashion Designer or be part of the global fashion market, this degree gives you the necessary knowledge, skills and know how to be what you aspire..

**II. SALIENT FEATURES**

- ❖ The department of Textile and Fashion Designing course offers a broad range of career-based programmes with up-to –date infrastructure and highly –qualified and dedicated staff members.
- ❖ It implements a comprehensive, technically –driven curriculum and evolution system to ensure that its graduates are in exclusive demand in India and globally, for their exemplary technical and professional competencies, and also for their capability to take up higher education programmes.
- ❖ It encourages active research and the spirit of innovation among its faculty and students and promotes collaborative initiatives with industry and institution of high standing.
- ❖ It respects and demonstrates the core values of equity, team work, environment-friendliness and transparency

**III. OBJECTIVES OF THE PROGRAMME**

- ❖ To Provide good theoretical knowledge and practical skills required for careers in Business
- ❖ To expose the students to industries through internship, field visit, guest lecture, and projects.
- ❖ To inculcate innovative and creative thinking among students, due to the encouragement of student research activities.
- ❖ To encourage students honing their skills through students Association activities, Effective communication and Placement training programmes.

**IV. ELIGIBILITY FOR ADMISSION**

Candidate seeking admission to the first year Degree of Bachelor of Science in Textile and Fashion Designing shall be required to have passed in any Higher Secondary course examination (Regular academic or Vocational) of the State Board/CBSE/ICSE or other examination accepted as equivalent thereto by the Syndicate, subject to such other conditions as may be prescribed. Pass in

any three year Diploma in Fashion/Costume/Textile/Apparel related course is eligible to admit in direct second year of this UG course.

#### **V. DURATION OF THE PROGRAMME**

- ❖ The course shall extend over a period of three academic years consisting of six semesters. Each academic year will be divided into two semesters. The First semester will consist of the period from July to November and the Second semester from December to March.
- ❖ The subjects of the study shall be in accordance with the syllabus prescribed from time to time by the Board of Studies of Vivekanandha College of Arts and Sciences for Women with the approval of Periyar University, Salem.
- ❖ Each subject will have four to six hours of lecture per week apart from practical training at the end of each semester.

#### **VI. CONTINUOUS INTERNAL ASSESSMENT (CIA)**

The performance of the students will be assessed continuously and the Internal

ASSESSMENT MARKS **FOR THEORY PAPERS** WILL BE AS UNDER:

|   |                      |   |       |
|---|----------------------|---|-------|
| 1 | Average of Two Tests | - | 05    |
| 2 | Model Exam           | - | 10    |
| 3 | Assignment           | - | 05    |
| 4 | Attendance           | - | 05    |
|   |                      |   | Total |
|   |                      |   | - 25  |

ASSESSMENT MARKS **FOR PRACTICAL PAPERS** WILL BE AS UNDER:

|   |                  |   |       |
|---|------------------|---|-------|
| 1 | Model Exam       | - | 20    |
| 2 | Observation Note | - | 10    |
| 3 | Attendance       | - | 10    |
|   |                  |   | Total |
|   |                  |   | - 40  |

#### **PASSING MINIMUM - EXTERNAL**

|                                 |  |
|---------------------------------|--|
| <b>THEORY</b>                   | In the End Semester Examinations, the passing minimum shall be 40% out of 75 Marks. (30 Marks) |
| <b>PRACTICAL / MINI PROJECT</b> | In the End Semester Examinations, the passing minimum shall be 40% out of 60 Marks. (24 Marks) |

## **VII. ELIGIBILITY FOR EXAMINATION**

A candidate will be permitted to appear for the End semester Examination only on learning 75 % of attendance and only when her conduct has been satisfactory. It shall be open to grant exemption to a candidate for valid reasons subject to conditions prescribed.

### **DISTRIBUTION OF MARKS FOR ATTENDANCE:**

| <b>ATTENDANCE<br/>PERCENTAGE</b> | <b>MARKS</b>  |                  |
|----------------------------------|---------------|------------------|
|                                  | <b>THEORY</b> | <b>PRACTICAL</b> |
| 75-80                            | 1             | 2                |
| 81-85                            | 2             | 4                |
| 86-90                            | 3             | 6                |
| 91-95                            | 4             | 8                |
| 96-100                           | 5             | 10               |

## **VIII. CLASSIFICATION OF SUCCESSFUL CANDIDATES**

Successful candidates passing the Examination of Core Courses (Main & Allied Subjects) & Securing Marks.

- a) 75 % and above shall be declared to have passed the examination in First Class with Distinction provided they pass all the examinations prescribed for the course at first appearance itself.
- b) 60% and above but below 75 % shall be declared to have passed the Examinations in First Class..
- c) 50% & above but below 60% shall be declared to have passed the examinations in Second Class.
- d) All the remaining successful candidates shall be declared to have passed the examinations in Third Class.
- e) Candidates who pass all the examinations prescribed for the course at the First appearance itself and within a period of Three Consecutive Academic years from the year of admission only will be eligible for University Rank.

## **IX. ELIGIBILITY FOR AWARD OF THE DEGREE**

A candidate shall be eligible for the award of the Degree only if she has undergone the above Degree for a period of not less than Three Academic years comprising of six semesters and passed the Examinations prescribed and fulfilled such conditions has have been prescribed therefore.

## **X. PROCEDURE IN THE EVENT OF FAILURE**

If a candidate fails in a particular subject, she may reappear for the university examination in the concerned subject in subsequent semesters and shall pass the examination.

## **XI. COMMENCEMENT OF THESE REGULATIONS**

These regulations shall take effect from the academic year 2018-19 (i.e.) for the students who are to be admitted to the First year of the course during the Academic year 2018-19 and thereafter.

## **XII. TRANSITORY PROVISIONS**

Candidates who were admitted to the UG course of study before 2018-2019 shall be permitted to appear for the examinations under those regulations for the period of Three years i.e., up to and inclusive of the Examinations of 2021-2022. Thereafter, they will be permitted to appear for the examinations only under the regulations then in force.

### **EVALUATION OF EXTERNAL EXAMINATIONS (EE)**

| <b><u>QUESTION PAPER PATTERN – Theory</u></b>   |  |
|---|--|
| <b>Time duration: 3 Hours</b>   |  |
| <b>Max. Marks: 75</b>   |  |
| <b>PART- A:<br/>(20 x 1= 20)</b>  | Answer all the Questions<br>Four Questions from each Unit                            |
| <b>PART- B:<br/>(5 x 5 = 25)</b>  | Answer all the questions<br>One Question from each Unit (Either or Type)             |
| <b>PART- C:<br/>(3 x 10 = 30)</b>   | Answer any <b>THREE</b> of the questions<br>One Question from each Unit (3 Out of 5) |
| <b>IN THE END SEMESTER EXAMINATIONS, THE PASSING MINIMUM SHALL BE<br/>40% OUT OF 75 MARKS. (30 MARKS)</b> |  |

| <b><u>QUESTION PAPER PATTERN – Practical</u></b>  |                 |
|---|-----------------|
| <b>Time duration: 3 Hours</b>   |                 |
| <b>Max. Marks: 60</b>   |                 |
| 1. One compulsory question from the given list of objectives  | <b>30 Marks</b> |
| 2. One either/or type question from the given list of objectives  | <b>30 Marks</b> |
| <b>IN THE END SEMESTER EXAMINATIONS, THE PASSING MINIMUM SHALL BE<br/>40% OUT OF 60 MARKS. (24 MARKS)</b> |                 |

### **Programme Specific Outcomes (PSOs)**

- To impart theoretical & practical knowledge so as to provide a strong foundation for studies for career.
- To prepare the students for a wide variety of jobs in garment industry and to apply their creative mind in the designing of apparel and home textile
- Wide variety of employability options such as Design Director, Fashion Director, Style advisor, Fashion Buyer, Design Manager, Design Consultant, Fashion Blogger, Couturier, Fashion critic, Fashion Illustrator and Fashion Merchandiser

### **Programme Outcomes (POs)**

- ❖ Analyze and identify required parameters vital to design and manufacture apparel products suiting the needs of the market
- ❖ Acquire creative and innovative skills in designing apparels with due considerations to public health, safety, cultural, societal and environmental factors.
- ❖ Understand the impact of sustainable development in apparel manufacturing processes.
- ❖ Understand the commitment towards professional ethics and responsibilities in the entire textile business process.
- ❖ Apply the knowledge, skill and attitude as a team player in initiating, executing and managing projects in the areas of design, manufacture, marketing and entrepreneurship in multi-disciplinary environments.
- ❖ Students would be equipped with Skills for Life Long Learning.
- ❖ Students would have set up strong foundation to their career in the field of Costume design and fashion.
- ❖ Students would have acquired essential workplace skills.
- ❖ Apply the technical skills to analyze and execute various of designs.
- ❖ Understand how the Indian and Global fashion markets work and be able to work in it.
- ❖ Students would develop professional practices in tune with the changing Dynamics of the Fashion industry landscape.
- ❖ To be Equipped with Skills for Life Long Learning.
- ❖ To set up strong foundation to their career in the field of Costume design and fashion.
- ❖ To acquire essential workplace skills.
- ❖ To apply the technical skills to analyze and execute various of designs.
- ❖ To understand how the Indian and Global fashion markets work and be able to work in it.
- ❖ To develop professional practices in tune with the changing Dynamics of the Fashion industry landscape.

**Program Educational Outcomes (PEOs)**

The **B.Sc. ( Textile & Fashion Designing)** program describe accomplishments that graduates are expected to attain within five to seven years after Graduation

|       |   |
|-------|---|
| PEO1  | The student can excel in the field of <b>Textile &amp; Fashion Designing</b> after the completion of the Program. |
| PEO2  | The student can develop his own brands in Apparel Sector.   |
| PEO3  | Start- Up of An Entrepreneur with potential is possible with new ideas towards Apparel Industry.                  |
| PEO4  | The student can choose to work as a freelance designer.   |
| PEO5  | The student can begin his career in the area of Apparel Production.   |
| PEO6  | The student can work as Quality Mangers in Garment Industry   |
| PEO7  | The student can work as Fabric Mangers in woven & Knitted Fabric sector.  |
| PEO8  | The student can also work as an industrial engineer.  |
| PEO9  | The student can work as Merchandiser and Costing Mangers in Garment Industries.                                   |
| PEO10 | The student can act as Consultant in Apparel Sectors.   |

**TFD CURRICULUM FOR ACADEMIC YEAR 2021 – 2022**

**COURSE PATTERN AND SCHEME OF EXAMINATIONS UNDER AUTONOMOUS,  
CBCS & OBE PATTERN**

**FOR THE CANDIDATES ADMITTED FROM THE YEAR 2021 – 2022**

**SEMESTER: I & II**

| SEM          | PART         | COURSE CODE          | COURSE TITLE                               | Hrs       | CRE DIT   | MARKS      |            |            |
|--------------|--------------|----------------------|--|-----------|-----------|------------|------------|------------|
|              |              |                      |  |           |           | CIA        | EE         | TOT        |
| I            | I            | Language             | Tamil – I                                  | 6         | 5         | 25         | 75         | 100        |
|              | II           | Language             | English – I                                | 6         | 5         | 25         | 75         | 100        |
|              | III          | Core practical -1    | Pattern making and grading practical       | 5         | 3         | 40         | 60         | 100        |
|              | III          | Core practical -II   | Basic Apparel Designing Practical          | 5         | 3         | 40         | 60         | 100        |
|              | III          | Allied               | Sewing Technology                          | 6         | 5         | 25         | 75         | 100        |
|              | IV           | Value Education      | Value Education-yoga                       | 2         | 2         | 25         | 75         | 100        |
|              | <b>Total</b> |                      |  |           | <b>30</b> | <b>23</b>  | <b>180</b> | <b>420</b> |
| II           | I            | Language             | Tamil – II                                 | 6         | 5         | 25         | 75         | 100        |
|              | II           | Language             | English – II                               | 6         | 5         | 25         | 75         | 100        |
|              | III          | Core -I              | Fibre to yarn science                      | 5         | 5         | 25         | 75         | 100        |
|              | III          | Core practical -III  | Fibre to yarn science practical            | 3         | 2         | 25         | 75         | 100        |
|              | III          | Allied practical -1  | Basic Draping practical                    | 3         | 2         | 40         | 60         | 100        |
|              | III          | Allied practical -II | Basic Illustration And Sketching practical | 6         | 3         | 40         | 60         | 100        |
|              | IV           | EVS                  | Environmental Studies                      | 1         | 1         | 25         | 75         | 100        |
| <b>Total</b> |              |                      |  | <b>30</b> | <b>23</b> | <b>205</b> | <b>495</b> | <b>700</b> |



**SEMESTER: III & IV**

| SEM | Part         | Course Code          | COURSE TITLE                   | Hrs | CREDIT    | MARKS     |            |            |
|-----|--------------|----------------------|--------------------------------|-----|-----------|-----------|------------|------------|
|     |              |                      |                                |     |           | CI A      | EE         | TOT        |
| III | III          | Core -II             | Fabric Science -I              | 5   | 5         | 25        | 75         | 100        |
|     | III          | Core -III            | Clothing Care                  | 5   | 5         | 25        | 75         | 100        |
|     | III          | Core Practical -IV   | Fabric Science Practical       | 3   | 2         | 40        | 60         | 100        |
|     | III          | Core Practical -V    | Children's Apparel Practical   | 5   | 3         | 40        | 60         | 100        |
|     | III          | Allied -II           | Fashion Designing              | 5   | 4         | 25        | 75         | 100        |
|     | III          | Allied practical-III | Fashion Designing Practical    | 3   | 2         | 40        | 60         | 100        |
|     | IV           | NMEC – I             | Visual Merchandising           | 2   | 1         | 25        | 75         | 100        |
|     | <b>Total</b> |                      |                                |     | <b>30</b> | <b>24</b> | <b>220</b> | <b>480</b> |
| IV  | III          | Core IV-             | Non Woven & Technical Textiles | 4   | 4         | 25        | 75         | 100        |
|     | III          | Allied III-          | Fashion Business Communication | 4   | 4         | 25        | 75         | 100        |
|     | III          | Core v               | Textile Processing             | 5   | 5         | 25        | 75         | 100        |
|     | III          | Core Practical vi-   | Women's Apparel Practical      | 6   | 3         | 40        | 60         | 100        |
|     | III          | Core Practical vii   | Textile Processing Practical   | 3   | 2         | 40        | 60         | 100        |
|     | III          | SBEC-I               | Embroidery Practical           | 4   | 2         | 40        | 60         | 100        |
|     | III          | NMEC II-             | Fashion Business               | 4   | 3         | 25        | 75         | 100        |
|     | <b>Total</b> |                      |                                |     | <b>30</b> | <b>23</b> | <b>220</b> | <b>480</b> |

**SEMESTER: V & VI**

| SEM                | Part         | COURSE CODE         | COURSE TITLE                                    | Hrs        | CRE DIT    | MARKS       |             |             |
|--------------------|--------------|---------------------|---|------------|------------|-------------|-------------|-------------|
|                    |              |                     |   |            |            | CIA         | EE          | TOT         |
| V                  | III          | Core VI-            | Computers & Textile In Garment Design           | 4          | 4          | 25          | 75          | 100         |
|                    | III          | Core VII-           | Textile Finishing                               | 4          | 5          | 25          | 75          | 100         |
|                    | III          |                     | Apparel Costing & Merchandising                 | 5          | 4          | 25          | 75          | 100         |
|                    | III          |                     | Internship Viva-Voce                            |            | 3          |             | 100         | 100         |
|                    | III          | Core Practical VIII | Computers & Textile In Garment Design Practical | 5          | 3          | 40          | 60          | 100         |
|                    | III          | Core Practical X    | Men'sApparel Practical                          | 5          | 3          | 40          | 60          | 100         |
|                    | IV           | MBEC-I              | Entrepreneurship Development of Skills          | 5          | 3          | 25          | 75          | 100         |
|                    | <b>Total</b> |                     |   |            | <b>30</b>  | <b>25</b>   | <b>180</b>  | <b>520</b>  |
| VI                 | III          | Core IX             | Knit Science                                    | 5          | 5          | 25          | 75          | 100         |
|                    | III          |                     | Apparel Production Management                   | 5          | 5          | 25          | 75          | 100         |
|                    | III          | Core Practical XI   | Accessories Making Practical                    | 4          | 2          | 40          | 60          | 100         |
|                    | III          | MBEC-II             | International Trade And Documentation           | 5          | 4          | 25          | 75          | 100         |
|                    | III          | SBEC II             | Fashion Portfolio Presentation Practical        | 3          | 2          | 40          | 60          | 100         |
|                    | III          | SBEC III-           | Beauty Care Practical                           | 4          | 2          | 40          | 60          | 100         |
|                    | V            |                     | Extension Activities                            | -          | 1          | -           | -           | -           |
|                    | <b>Total</b> |                     |   |            | <b>30</b>  | <b>22</b>   | <b>205</b>  | <b>495</b>  |
| <b>Grand Total</b> |              |                     |   | <b>180</b> | <b>140</b> | <b>1160</b> | <b>2940</b> | <b>4200</b> |

FIRST

SEMESTER

|                    |                          |          |          |          |          |
|--------------------|--------------------------|----------|----------|----------|----------|
| <b>Course Code</b> | <b>SEWING TECHNOLOGY</b> | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
|                    | <b>Allied</b>            | <b>4</b> | <b>2</b> | <b>-</b> | <b>5</b> |

### **Basic Knowledge in Garment Machineries**

#### **Course Objectives:**

1. To acquaint students of the basic production machinery and equipment used in apparel construction.
2. To learn about the garment industry.
3. To learn the working process of the various departments in garment industry.

#### **Expected Course Outcomes:**

1. On the successful completion of the course, student will be able to:
2. Describe the various machineries and process involved in fabric spreading and cutting.
3. Generalize the types of garment production machineries and its application methods.
4. Summarize the sewing machines and its special attachments for higher production.
5. Explain the special machines and its functions in Garment Industry.
6. Identify garment finishing machineries and its working principles.

#### **Unit: 1 Introduction to Sewing Process**

Introduction to sewing, History of sewing machines, Sewing Machine – parts and functions of single needle machine, Tools for measuring, marking, cutting & pressing. Selection of thread and needle for various types of fabric..

#### **Unit: 2 Classification of Sewing Machines**

Classification of sewing machines -Single Needle Lock stitch Industrial model, Over Lock Machine, Zig Zag Multi Purpose Machine, Double Needle Machine, Bar Tack Machine, button hole making machine, button fixing machine, blind stitching machine, fabric examining machine. Machine attachments - care and maintenance of sewing machines.

#### **Unit: 3 Basic Sewing Machine and its Details**

Basic sewing machines and associated work aids, simple automobiles. The use of components & trims – Labels and motifs, lining, Interlining, wadding, lace, braids & elastics, Hooks and loop fastening, Seam binding and tape, Shoulder pad, Eyelets & laces, Zip fastener, Buttons, Tack buttons, Snap fasteners and Rivets, Performance properties of components and trims. Sewing machines attachments – ( Hemmers, Ruffler, Binder, Tucker, cloth guide, zipper foot, gathering foot, feed cover plate, circular attachment). Common problem & remedies

#### **Unit:4 Fusing**

Fusing – Definition, advantages of using fusible interlinings, requirement of fusing, Fusing process. The means of fusing, Fusing equipments, Methods of fusing quality control in fusing. Alternative of fusible interlining. Pressing: the purpose of pressing, categories of pressing, means of pressing, pressing equipments and methods, pleating, permanent press. State of pressing.

#### **Unit:5 Stitching mechanism**

In Stitching mechanism – needles, bobbin and bobbin case, bobbin winding, upper and cover threading, auxiliary hooks, throat plates, take –ups tension disc. Feeding mechanism – drop feed, different fed, needle feed, compound feed, puller feed Introduction to various machines for garment finishing – Fusing – Sucking – Ironing - Packing.

**Text Book(s)**

1. The Technology of Clothing manufacture, Harold Carr and Barbara Catham, Blackwell Science (1994)
2. Goswami, B.C. "Textile Yarns", Technology, Structure and applications", McGraw Hill.
3. Chris Jefferys (2004), 101 Essential Tips- Basic Sewing, D.K. Publishing
4. Besty Hosegood (2006), The complete book of sewing, Dorling Kindersley Ltd., London.
5. Thomas Anna Jacob, "The art of sewing", USB publishers New Delhi, 1994.
6. Readers Digest sewing book.

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

<https://www.onlineclothingstudy.com/2018/05/machinery-needed-for-garment.html>

<https://garmentsmerchandising.com/garment-machine-function/>

[https://dir.indiamart.com/indianexporters/m\\_textmch.html](https://dir.indiamart.com/indianexporters/m_textmch.html)

**Course Code**                    **BASIC APPARELDESIGNING- PRACTICAL**  
**Core Practical-II**  
**Basic Knowledge in Garment Machineries**

**Course Objectives:**

1. To impart practical exposure in sewing operation.
2. To acquaint students with the knowledge on basic sewing techniques.
3. To impart the knowledge and skills required for garment designing.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Manipulate the various seams, seam finish and bias finishing techniques.
2. Customize the fullness methods, placket and fasteners attachments in garment.
3. Construct the various body parts of a garment.

P1 – Imitation; P2 – Manipulation; P3 – Precision; P4 – Articulation; P5 – Naturalization.

**1. Preparation Samples for the Following**

1. Preparation of Samples for Seams and Seam Finishes.
2. Preparation of Samples for Hems.
3. Preparation of Samples for Facing and binding.(Any2)
4. Preparation of Samples for Fullness. (Darts, Tucks, Pleats, Gathers, Flares, Ruffles, Godets and Gathers)
5. Preparation of Samples for Plackets and fasteners.(Any2)
6. Preparation of Samples for different Sleeves.(Any2)
7. Preparation of Samples for different Collars.(Any2)
8. Preparation of Samples for different Yokes.(Any2)
9. Preparation of Samples for different pockets(Any2)

**2. Prepare Miniature Samples for the following**

1. Skirt – pleated skirt, gathered skirt, circular skirt
2. Sleeve – Plain sleeve, Magyar Sleeve, Raglan Sleeve
3. Collar - Flat collar(any type), Open collar
4. Simple Yoke

**Text Book(s)**

1. Gayatri Verma and Kapil Dev,(2006).Cutting and Tailoring Course. New Delhi: Asian Publishers
2. KR Zarapker, (2005).Zarapker System of Cutting.New Delhi: Navneet Publications Ltd.
3. Thangam Subramaniam,(2006). Dress Making- Bombay Tailoring and Embroidery College
4. Ruth Sleight Johnson,(2011).Practical sewing techniques. London :A&C Black publishers

**Related Websites**

1. <https://ecourseonline.iasri.res.in/mod/page/view.php?id=114171>
2. <https://www.fibertofashion.com/industry-article/5658/basic-of-pattern-making>
3. <https://www.clothingpatterns101.com/style-lines.html>

|                    |  |          |          |          |
|--------------------|--|----------|----------|----------|
| <b>Course Code</b> | <b>PATTERN MAKING &amp; GRADING L</b>          | <b>T</b> | <b>P</b> | <b>C</b> |
|                    | <b>CORE PRACTICAL-I</b>                        | <b>2</b> | <b>2</b> | <b>-</b> |
|                    | <b>Basic Knowledge in Textiles and Science</b> |          |          | <b>3</b> |

**Course Objectives:**

1. To enable the students to develop the ability to create design through flat pattern technique.
2. To impart skills in dart manipulation.
3. To enable the students to learn the skills of standardizing body measurements

**Expected Course Outcomes:**

**On the successful completion of the course, student will be able to:**

1. Infer about pattern making terminology and steps in taking body measurement.
2. Summarize the pattern drafting techniques and fitting standards for different garments.
3. Generalize the Pattern Draping techniques and its facts.
4. Predict different pattern grades and fabric grains for cutting.
5. Explain pattern alteration techniques and predict the various kinds of pattern layout.

**I.Draft and grade the Patterns for the following**

**a) Sleeve**

1. Plain sleeve
2. Puff sleeve at top and bottom
3. Bell sleeve
4. Raglan sleeve
5. Cap sleeve
6. Kimono sleeve
7. Bishop sleeve
8. Leg-of-mutton sleeve
9. Petal sleeve

**b) Collar**

1. Cowl Collar
2. Crew Collar
3. Detachable Collar
4. Jabot Collar
5. Johnny Collar
6. Mandarin Collar
7. Notched Collar
8. Peter Pan Collar
9. Pointed Flat Collar
10. Polo Neck Collar
11. Ruffle Collar (Ruff)
12. Sailor Collar
13. Shawl Collar
14. Shirt Collar
15. Turtle Neck Collar
16. Winged or Whisk Collar

**c) Yoke**

1. Simple Round yoke
2. Straight yoke
3. Square Yoke Pattern
4. Pentagonal yoke pattern

SECOND  
SEMESTER



**Course Code**                      **FIBER TO YARN SCIENCE**  
**Core-I**  
**Basic Knowledge in Textiles and Science**

**Course Objectives:**

The main objectives of this course are to:

1. To facilitate the students to understand the structural features of Fibers and Yarn.
2. To investigate techniques of textile fibers and yarn with its manufacturing Process.
3. To Learn the Properties and behavior of Fibers and Yarn.
4. To Gain knowledge in Advanced Spinning System.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Recognize the molecular conformations of various textile fibers.
2. Explain the production process of various textile fibers and yarns.
3. Utilize the Fibers and Yarns in different fields of Textile Industry.
4. Analyze the structural investigations techniques of Fibers and Yarn.
5. Outline the Properties and behavior of textile fibers and Yarns.

**Unit:1 Introduction of Textile Fibers**

Introduction of textile fibers: Classification - Physical and chemical properties. Cotton: Botanical and commercial classification - Properties - End uses. Brief study about Organic cotton Flax: Properties - End uses. Brief study about organic cotton. Wool: Producing countries - Grading - Properties - End uses - Felting –Woolen and Worsted Yarns. Silk: Producing countries – Degumming – Weighting– Properties - End uses. Brief study on wild silk varieties.

**Unit:2 Filament Spinning System**

Methods of filament spinning. Semi synthetic fibers: Regenerated and modified cellulose - Viscose rayon process flow - HWM fibers - End uses –Brief study of Bamboo, Lyocell, Soya bean fibers.

**Unit:3 Polymer Science**

Polymer – Terminologies – Types of polymers & Polymerization. Synthetic fibers: Brief study about Polyamide, Polyester, Poly Acrylic and Spandex. Individual fiber properties and trade names–End uses. Drawing and effects. Texturization: definition, types, properties of textured yarn- its uses. Micro fibers.

**Unit:4 Yarn Production Process**

Classification of yarn types- Staple spinning system – Types. Yarn manufacturing Process: Ginning- objectives, Objectives and process sequence –Blow room, carding, Drawing, combing, simplex, ring frame, Comparison of carded and combed yarn. Principles and process sequence - Rotor spinning, Compact Spinning.

**Unit:5 Post Yarn Process**

Post spinning process: cone winding, Doubling, reeling- Ply yarn and single yarn Characteristics. Properties required for export quality hosiery yarns. Study of yarn twist and its importance - Various yarn & package defects. Yarn numbering systems. Blended textiles: Types of blending Benefits Double yarn Properties Uses. Classification of Sewing threads & applications core spun sewing thread – Advantages.

**Text Book(s)**

1. A Text Book of Fiber Science and Technology, Mishra, S.P, New Age International (P) Ltd Publishers, New Delhi 2000.
2. Spun Yarn Technology, Eric Oxtoby, Butterworth-Heinemann, Published in 1987.
3. The Motivate Series – Textiles, Wynne, A, Publisher : Macmillan Education Ltd., London, 1997.
4. Hand Book of Textile Fibers – Vol. I & Vol. II. Gordon Cook, J, Wood Head Publishing Ltd., Cambridge, England, 1984.
5. Man-made Fibers, Moncrieff, W, Butterworth Scientific Publication, 1975.
6. Handbook of Textile Fibers: Natural Fibers, J Gordon Cook , Woodhead publication Limited, 1984.

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://textilelearner.blogspot.com/>
2. <https://www.textiletoday.com.bd/category/innovations/fiber-yarn-fabric/>
3. <https://study.com/academy/lesson/textile-yarns-definition-types-classification.html>

|                    |   |          |          |          |          |
|--------------------|---|----------|----------|----------|----------|
| <b>Course Code</b> | <b>FIBER &amp; YARN SCIENCE - PRACTICAL</b> | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
|                    | <b>Core Practical- I</b>                    | <b>-</b> | <b>-</b> | <b>4</b> | <b>2</b> |

### Basic Knowledge in Textiles and Science

#### Course Objectives:

1. To train the students on identification of different kinds of fibers based on different tests and measurement of properties of fibers.
2. To facilitate the students to understand the structural features of Fibers and Yarn.
3. To Learn the Properties and behavior of Fibers and Yarn

#### Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1. Discover the natural and man-made fibres using various identification test methods.
2. Determine the blend proportion of different fibers from the blended material.
3. Calibrate the count and twist of the textile yarn.

#### LIST OF EXPERIMENTS

1. Longitudinal view of Natural fibers  
A) Cotton B)Silk C)Wool
2. Longitudinal view of Manmade fibers  
A) Polyester B) Viscose C)Nylon
3. Burning characteristic of Natural fibers  
A) Cotton B)Silk C)Wool
4. Burning characteristic of manmade fibers  
A) Polyester B) Viscose C)Nylon
5. Solubility test of Natural fibers  
A) Cotton B)Silk C)Wool
6. Solubility test of manmade fibers  
A) Polyester B) Viscose C)Nylon
7. Determination of blend proportion of P/C blends
8. Determination of blend proportion of P/V blends
9. Determination of blend proportion of P/W blends
10. Determination of Yarn count
11. Determination of Yarn Twist

#### Text Books

1. Raoul Jewel, (2000), Encyclopedia of dress making, Delhi, APH Publishing Cooperation.
2. Claire B. Schaeffer (1994), Fabric Sewing Guide, Lola, Wisconsin, Krause Publishers.
3. Handbook of Textile fibers, Woodhead Publications, (1984).

#### Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1. <https://nptl.ac.in/courses/116/102/116102026/>
2. [https://onlinecourses.swayam2.ac.in/cec19\\_te01/preview](https://onlinecourses.swayam2.ac.in/cec19_te01/preview)
3. <https://textilelearner.blogspot.com/>

**Course code**

**BASIC DRAPING PRACTICAL  
ALLIED PRACTICAL- I  
Basic knowledge in pattern making**

**Course Objectives:**

The main objectives of this course are to:

1. To understand the basic draping & manipulation techniques.
2. To design and develop patterns for different garments based on the body measurements.
3. To interpret and transform their designs on a three-dimensional form using draping method.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Prepare muslin and formulate the measurements for various garment's draping
2. Produce the pattern blocks in dress form for various garments
3. Create dart or pleat variations in appropriate garment patterns

**LIST OF EXPERIMENTS**

1. Bodice - Front & Back
2. Skirt - Front & Back and Its Types
3. Pant - Front & Back
4. Sleeve - Bell, Raglan, Cape, Puff, Circular, Kimono
5. Neckline - Boat, Key Hole, Halter, Scooped, Scalloped
6. Collar - Mandarin, Peter pan, Turtle, Ruffled & Shawl
7. Cowls
8. Twist
9. Surplice
10. Yoke - Hip Yoke, Midriff & Shirt Yoke
11. Design and Drape one couture wear for Men & Women

**Text Book(s)**

1. Draping for Fashion Design, 5th Edition, Nurriesrelis, Hilde Jaffe and Rose Mary Torre, Pearson Prentice Hall Publications, United States, 2012.
2. The Art of Fashion Draping, Connie Amadan Crawford, Fair Child Publications, New York, 2005.
3. Draping for Apparel Design – 3rd Edition, Helen Joseph and Armstrong, India, Bloomsbury Publications India Ltd, 2013.
4. Cutting and Draping Special Occasion Cloths: Designs for Party wear and Evening wear, Dawn Cloak, London, Batsford, 1998.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1. <https://style2designer.com/apparel/draping-mannequin/what-is-draping-technique-and-its-process/>
2. <https://www.aicp.fr/portfolio-items/moulage-technique-du-moulage/?lang=en#:~:text=Draping%2C%20the%20most%20ancient%20of,to%20create%20a%20fabric%20prototype>

**Course Code**                    **BASIC ILLUSTRATION & SKETCHING - PRACTICAL**  
**Allied Practical-I**  
**Basic Knowledge in Garment Machineries**

**Course Objectives:**

1. Students will learn the basic objects drawing and shades.
2. They will learn basic head theories and draw human figures at different angles
3. They will create garment design for various seasons on fashion figures.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Compose various types of garment and its parts
2. Design different kinds of accessories and ornaments
3. Deconstruct the various head theories of human figures, features and different positions of body parts.

**List Of Experiments**

1. Different types of collar, Sleeve, Neckline and skirts.
2. Different types of ladies tops, Shirt, Pant(Full and half)
3. Different types of Accessories – Bags ,footwear , hats etc
4. Different types of Ornaments
5. Facial features – Eyes ,nose , lips, Ears
6. Face ,hands legs – Different positions
7. Lay figure -7 1/2 head
8. Fashion figure -8 , 10 ,12 head.

**Text Book(s)**

1. Patric John Ireland, Fashion Design Illustration –Women, B.T.Batsfort Ltd, London(1993).
2. Patric John Ireland, Fashion Design Drawing and Presentation, B.T.Batsfort Ltd, London(1982).
3. Patric John Ireland, Fashion Design Illustration –Men, B.T. Batsfort Ltd, London(1996).
4. Wolfgang. H. Hageney, Checks And Stripes –Classic Variations in Colour Vol.I, Belveden(1997).

**THIRD  
SEMESTER**

**Course Code****FABRIC SCIENCE  
Core-II  
Basic Knowledge in Garment Machineries****Course Objectives:**

1. To impart knowledge on woven fabrics
2. To help students understand fabric formation process.
3. To impart knowledge on woven fabric Designs and Structures.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Clarify the preparatory processes involved in the woven fabric production.
2. Explain the principles of sizing process and its methods.
3. Infer about the basic mechanism of loom and its structure.
4. Categorize the woven fabrics and its structure
5. Differentiate the types of looms and jacquard mechanisms involved in woven fabric production.

**Unit:1 Preparatory Process**

Classification of fabric forming methods – Weaving preparatory processes - Objects of winding process – Winding types – Passage of material through high-speed automatic cone winding machine – Passage of material through precision winding machine – Winding terminologies, open wind and close wind – Winding defects, causes & remedies. Pirn winding – Objects - Passage of material through an automatic high speed pirn winder.

**Unit:2 Sizing Process**

Objects of warping – Types of warping – Passage of material through high-speed modern beam warping machine & sectional warping machine – Warping defects, Causes & remedies. Objects of sizing – comparison of two cylinder, multi cylinder & hot air sizing machines – Sizing ingredients & their functions – Size paste preparation – Sizing defects, causes & remedies

**Unit:3 Basic Mechanisms of Looms**

Passage of material through a plain power loom – Basic mechanisms of a loom – Primary, secondary & auxiliary motions – Tappet shedding – Cone over pick & under pick mechanisms – Beat up mechanism – Types of let off & take up mechanisms – Fabric defects, causes & remedies

**Unit:4 Weaving and its types**

Introduction to weaves – Weave diagram – Plain weave & derivatives – Twill weave & derivatives – Satin & sateen weaves – Ordinary and Brighten Honey Comb; Huck-a-Back; Mock Leno; extra warp and extra weft figuring – single and double colour.

**Unit:5 Loom types**

Objects of dobby & jacquard mechanisms – Types of dobby & jacquard – Study of negative & positive dobbies – Study of single cylinder & double cylinder jacquard mechanisms. Shuttle less looms: Introduction - Advantages - Types of shuttle less looms: projectile, rapier, air jet, water jet and multi phase weaving.

**Text Book(s)**

1. R.Marks, A.T.C. Robinson, Principles of Weaving, The Textile Institute, Manchester(1976)
2. B.Hasmukhrai, Fabric Forming, SSM ITT Co operative stores Ltd, Komarapalayam(1996).
3. K.T.Aswani, Fancy Weaving Mechanism, Mahajan Book Distributors, Ahmadabad(1990).
4. N.Gokarneshan, Fabric Structure and Design, New Age International Publishers,New Delhi(2004).

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://www.cottonworks.com/topics/sourcing-manufacturing/weaving/basic-woven-designs-introduction-to-woven-fabric/>
2. <https://www.textileschool.com-453-wovendesign->
3. <https://www.intechopen.com/books/advances-in-modern-woven-fabric-technology/color-and-weave-relationship-in-woven-fabric>



**Course Code****CLOTHING CARE****Core-X****Basic Knowledge about garment and fabric care****Course Objectives:**

1. This course facilitates an understanding, care and maintenance of textiles and orients the learners in the field of clothing industry.
2. The learners are expected to know the laundry soaps, Laundry equipment and dry cleaning in textile industry.
3. Impart the knowledge of machines and equipment used in washing, storing, and ironing process.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Identify the suitable methods of washing, drying, ironing and storing
2. Evaluate the methods and equipment to be used for the better life of clothes
3. Appraise the stiffening agents used in fabric washing.
4. Recognize the principles of washing and its facts.
5. Analyze the special types of laundry for special fabrics and care label symbols.

**Unit:1 Clothing Care Essentials**

Water- hard and soft water, Determination of water hardness methods of softening water. Zeolite or Base Exchange method. Laundry Cl soaps – Manufacture of soap and methods, composition of soap, types of Soap, soap less detergents, chemical action, detergent manufacture, and advantages of detergents. Difference between soap and detergents.

**Unit:2 Laundry and Drying Equipment**

Laundry equipment and reagents: Study of laundry equipment and laundry reagents - soaps - detergents - cleaning action of soaps, indigenous cleaning agents - rita nut - shikakai - green gram - bran solution – study of modern and industrial cleaning agents

**Unit:3 Finishes and stiffening agents**

Stiffening Agents: Study of stiffening agents –purpose of stiffening-classification of stiffening Agents preparation and uses of stiffeners – natural and commercial starches – reparation of starch for use – bleaching agents - bluing and tinting agents and their application–optical whiteners.

**Unit:4 Principles of Washing**

Washing Machine And Care Labels: Study of different types of house hold/industrial washing machine- rotary - swirling - pressure - tumble wash etc; the various systems of care labeling - washing instruction. Bleaching instruction – drying instruction-ironing instruction-dry cleaning instruction. Placement of labels on garments.

### **Unit:5 Special Types of Laundry & Care Labels**

Stain Removal: Principles of laundering – stain removal – various solvents for stain removing blood, tea, rust; oil/grease etc. – different methods of washing - application of friction by hand rubbing - scrubbing - tumble wash. General rules and ways of stain removal.

#### **Text Book(s)**

1. Dantyaigis, —Fundamentals of Textile and Their Care||, Oriental Longmans Ltd, New Delhi, 1996
2. Denlkar, —Household Textiles and Laundry Work||, Atma Ram and Sons, Delhi, 1993
3. Neomi D'Souza, —Fabric Care||, New Age International Publisher, 1998
4. Davis, —Laundry and Clothing Care||, Drama Book Publishers, 1995

#### **Related Websites**

1. <https://www.bhg.com/homekeeping/laundry-linens-cloths-how-to-wash-clothes-by-hand/>
2. <https://textilelearner.blogspot.com/2013/07/textile-finishing-processing.html>

**Course Code**

**FABRIC SCIENCE PRACTICAL**

**Core Practical-III**

**Basic Knowledge in Garment Machineries**

**Course Objectives:**

1. To impart the knowledge about the physical property of textile & their testing procedures and to develop an understanding of the principles involved in testing.
2. To identify the different types of weaves
3. To understand the woven fabrics designs

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to

- 1 Calibrate design, draft and peg-plan for simple woven fabrics.
- 2 Determine the designs for decorative woven fabrics.
- 3 Formulate the draft and peg-plan for decorative woven fabrics

To analyse the following particulars of the woven fabrics: Woven structural analysis: Design, Draft, Peg-plan

1. Plain weave and its derivatives
2. Twill weaves – 2/1, 3/1.
3. Satin / Sateen
4. Honey comb
5. Huck – a – back
6. Crepe weaves
7. Extra Warp
8. Extra Weft
9. Mock leno
10. Pile weave
11. Fancy weave

**Text Book(s)**

1. Principles of weaving, R. Marks, A.T.C. Robinson, Publication by the textile institute Manchester (1976)
2. Fabric forming, B. Hasmukhroi, Publication by SSM ITT Cooperative stores Ltd, Komarapalayam (1996)
3. Weaving mechanism Vol 1 & Vol 2, Prof. N.N. Banerjee, Published by Srimati. Tandra Banerjee,
4. West Bengal (1999)
5. Mechanism of Weaving machines, Prof. J.L. Chakravorty, Srimati B. Chakravorty, Serapur,

6. Publication by West Bengal, 1984
7. Handbook of Weaving, Sabit Adanur, Technomic publishing Company, Inc, USA (2001)

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://www.cottonworks.com/topics/sourcing-manufacturing/weaving/basic-woven-designs-introduction-to-woven-fabric/>
2. <https://www.textileschool.com-453-wovendesign->
3. <https://www.intechopen.com/books/advances-in-modern-woven-fabric-technology/color-and->
4. [weave-relationship-in-woven-fabric](#)

**Course code**

**CHILDREN'S APPAREL PRACTICAL  
Core Practical-V  
Basic knowledge about knit fabric**

**Course Objectives:**

1. Designing, drafting and constructing the following garments for the features Prescribed
2. List the measurements required and materials suitable Calculate the cost of the garment
3. Calculate the material required-Layout method and direct measurement Method

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Design and generalize the measurements for the various kids' garments.
2. Prepare patterns and calculate material requirement for the designed kid's wear.
3. Construct the designed kid's garment and calibrate the cost of the garment.

**List of Experiments:**

1. Bib- Variation in outline shape
2. Panty-plain or plastic lined panty
3. Jabla- without sleeve, front open (or) Magyar sleeve, back opens
4. Baba suit- knicker with chest piece attached (or) Romper
5. A-Line Frock- double pointed dart, neck line and arm hole finished with facing
6. Summer frock- with suspenders at shoulder line, without sleeve/collars(or) Angel top with raglan sleeve, fullness at neck line
7. Yoke frock- yoke at chest line, with open, puff sleeve, gathered skirt OR frock-with collar, without sleeve, gathered/ circular skirt at waist line(or) Princess line frock
8. Knicker- elastic waist, side pockets.
9. Shirt- open collar, with pocket

**Text Book(s)**

1. Practical Clothing Constructing-Part I and II, Mary Mathews, Cosmic Press, Chennai(1986)
2. Zarpker System of Cutting- Zarpker. K. R, Navneet Publications Ltd.
3. Cutting & Tailoring course, Gayathri Verma & Kapil Dev, Computech Publications

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://epgp.inflibnet.ac.in/home/viewsubject?catid=827>
2. <https://www.youtube.com/watch?v=LuazkYL0j3a>
3. <https://www.youtube.com/watch?v=nI-shbmnuVg>

**Course code**

**FASHION DESIGNING**

**Allied-III**

**Have basic knowledge in designing**

**Course Objectives:**

1. The main objectives of this course are to:
2. Impart knowledge on design concepts in the field of fashion
3. Familiarize with the fashion cycles, consumers and theories
4. Design suitable garments for unusual figure types

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Distinguish fashion and differentiate elements and principles of design
2. Generalize the colour combinations with standard colour harmonies
3. Interpret the fashion evolution, consumer groups in fashion theories and forecasting.
4. Justify the different dress designs for unusual figure types
5. Describe fashion terminologies and fashion profiles

**Unit:1 Design Elements and Principles**

Design- definition and types – structural and decorative design, requirements of a good structural and decorative design in dress Elements of design and its application in dress – line, shape or form, colour and texture. Principles of design and its application in dress – balance, rhythm, emphasis, harmony and proportion.

**Unit:2 Standard Colour Harmonies**

Colour theories; Prang colour chart Dimensions of colour- hue, value, and intensity.  
Standard colour harmonies – Related, Contrasting and Neutral colour harmony; Application of Colour in principles of design- application of the same in dress design.

**Unit:3 Fashion Evolution and Fashion Forecasting**

Fashion evolution – Fashion cycles, Length of cycles , consumer groups in fashion cycles – fashion leaders , fashion innovators, fashion motivation , fashion victim, Fashion followers. Adoption of Fashion theories – Trickle down, trickle up and trickle across. Fashion forecasting – Need for forecasting

**Unit:4 Designing Dresses for Unusual Figures**

Designing dresses for unusual figures – becoming and unbecoming – for the following figure types. Stout figure, thin figure, slender figure, narrow shoulders, broad shoulders, round shoulders, large bust, flat chest, large hip, large abdomen, round face, large face, small face, prominent chin and jaw, prominent forehead

**Unit:5 Fashion Terminologies and Fashion Profiles**

Definition and meaning of the fashion terms – fashion, style, line and collection, Mannequin and dress forms; fashion show; high fashion; Haute couture, couture and couturier; knock-off; Avant Garde; Pret- a -porter. Role/qualities of a Fashion Designer, Fashion Stylist, Fashion Journalist, Fashion Merchandiser, Fashion Director.

**Text Book(s)**

1. Fashion Sketch Book – Bina Abling, Fair Child Publications, New York Wardrobe,1988.
2. Art and Fashion in Clothing Selection – Mc Jimsey and Harriet, Iowa State University Press,Jowa,1973.
3. Fashion from Concept To Consumer – Frings Gini Stephens, Pearson Education, US, 1998.
4. Inside the Fashion Business – Kitty G. Dickerson, Pearson Education,US, 2007.

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://www.apparesearch.com/terms/index.html>
2. <https://www.instyle.com/fashion>
3. <https://prezi.com/1tlwgnhviqs-/fashion-elements-and-principles-of-design/>

**Course code**

**FASHION DESIGNING PRACTICAL  
Allied Practical-III  
Knowledge in Fashion Sketching**

**Course Objectives:**

The main objectives of this course are to:

1. Familiarize with the elements and principles of design
2. Play with colours following the standard colour harmonies
3. Create garment design for various seasons on fashion figures

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Demonstrate Prang colour chart, value and intensity chart
2. Calibrate various head theories and figures for a child, women and men
3. Sketch garment designs by using elements of design and also the applications of principles of design.
4. Develop colour harmonies in garment design and design garments for various seasons.

**1. Prepare the following Charts**

- Prang colour chart,
- Value chart
- Intensity chart

**2. Illustrate Human Figure for the Following Heads**

- Child - 6head
- Women – 8 head,10 head and 12 head
- Man – 10head

**3. Illustrate Garment Designs for the Elements of Design (3 each)**

- Line
- Texture
- Shape

**4. Illustrate Garment Designs for the Principles of Design**

- Balance (Formal and Informal)
- Harmony
- Emphasis
- Proportion
- Rhythm (by Repetition, Gradation and Line Movement)

**5. Illustrate the Colour Harmony in Dress Design**

- Monochromatic



- Analogous
- Complimentary  
Double complementary
- Split complementary
- Triad
- Neutral

#### **6. Create Garments for the Following Seasons**

- Summer
- Winter
- Autumn
- Spring

#### **Text Book(s)**

1. Fashion Sketch Book , Bina Abling, Fair Child Publications, New York Wardrobe,1988.
2. Illustrating Fashion, Kathryn McKelvey and Janine Munslow, Blackwell Science,1997.
3. Art and Fashion in Clothing Selection , Mc Jimsey and Harriet, Iowa State University Press, Iowa,1973.

#### **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://www.idrawfashion.com/>
2. <https://www.fashionistasketch.com/drawing-faces-fashion-illustration/>
3. <https://in.pinterest.com/pin/458804280762797371/>

**Course code**

**Visual Merchandising**  
**NMEC**  
**Have basic knowledge in designing**

**Course Objectives:**

1. The subject aims to make the students different types of fabrics, yarn & its use.
2. To facilitate the students to understand the structural features of Fibers and Yarn.
3. To investigate techniques of textile fibers and yarn with its manufacturing Process.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Categorize merchandising and its scope.
2. Interpret the Display Settings and Marketing
3. Explain Inspection methods and categorize different kind of Expedition Procedure.
4. Infer about woven fabric production and the constructional parameters of fabric.
5. Generalize the Advertising process and its application.

**Unit I**

Introduction to Visual Merchandising Visual merchandising and display; Purpose of visual merchandising; Store image; Target customers; Seasonal visual merchandise; Windows

**Unit II**

Display and Display Settings Types of display; Promotion vs. institutional display; Type of display setting Attention drawing devices: Colour; Lighting; Line and composition; Scale; Contrast; Repetition; Humour; Surprise and shock;

**Unit III**

Inspection and its types – Testing – Check points before cutting - Pilot run or trial run and its importance –Approvals - Types of approvals – Shipping marks – Final inspection procedures – Self, Second and Third party inspection - Effective expedition procedures.

**Unit IV**

Order sheet and its contents – Packing list and its contents – Document formats: order sheet, packing list, invoice, inspection and testing reports etc., - Assortment and its types. Documents recording and maintenance – Claims and reasons for claims - Factory audits – Buyer’s code of conducts.

**Unit –V Advertisings**

Advertising- scope, importance, types, merits & demerits; sales promotion, personal selling. Retail management. Export associations – Apparel Export Promotion Council – Journals and magazines related to apparel and textiles –Trade shows and Fairs – Participation in trade shows – Advantages of trade shows and fairs - Apparel & Textile Trade shows and fairs in India.

**Text Book(s)**

1. Jeannette Jarnow, Dickerson, Inside the Fashion Business, Prentice hall, USA.

2. 2. Darlie Koshy, Effective export marketing of Apparel, Global business press, 1996.
3. 3. Fashion Merchandising, Elian Stone,
4. 4. Apparel Merchandising, An integrated Approach, Krishnakumar, M, 2010, Abishek Publications
5. 5. Apparel Merchandising, Robin Mathew, Book Enclave Publishers, Jaipur

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://nptl.ac.in/courses/116/102/116102026/>
2. <https://www.intechopen.com/books/advances-in-modern-woven-fabric-technology/color-and-weave-relationship-in-woven-fabric>
3. <https://textilelearner.blogspot.com/2013/01/faultsdefects-in-knitted-fabrics.html>



FOURTH  
SEMESTER

**Course code**

**TEXTILE WET PROCESSING  
Core-VI  
Basic knowledge in textile finishing**

**Course Objectives:**

The main objectives of this course are to:

1. Dye and Print the fabrics the using suitable dyes and prints
2. Prepare on Effluent and its impact
3. Prepare the fabric for finishing

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Generalize the pre-preparatory process sequence in a textile industry
2. Explain the types of finishes used in textile materials
3. Discover the textile dyes and dyeing methods
4. Infer about direct printing methods
5. Outline about discharge printing and the need for effluent treatment

**Unit:1 Wet Processing Process and Basic Finishes**

Process sequence of textile wet processing; Finishes types – Basic finishes, Aesthetic finishes, Functional finishes and Special purpose finishes. Basic Finishes – Singeing, desizing, scouring, bleaching and mercerizing – Process sequence and methods.

**Unit:2 Aesthetic, Functional and Special Finishes**

Aesthetic finish– glazed, Moire, embossed, napped finish Functional finish – Water repellent, flame retardant, antistatic finish Special purpose finish – fragrance, antibacterial, stone wash and enzyme wash in denim Recent trends – Microencapsulation and nano finishes.

**Unit:3 Dyes and Dyeing Machines**

Dyes – classification and suitability of dyes to the fabric, stages of dyeing – fiber, yarn, fabric and garment dyeing, Natural dyes and its significance, Dyeing machines – loose stock fiber bale – hank package – jigger – winch – HT& HP Beam, jet – padding mangles. Garment dyeing machines

**Unit:4 Direct Printing**

Printing – Difference between dyeing and Printing. Preparation of Printing Paste, Properties and types of Thickeners, Direct Printing – Block Printing - History and techniques used. Screen Printing – Flat screen and Rotary screen, techniques used.

**Unit:5 Resist, Discharge Printing and Effluent Treatment**

Discharge Printing, other methods – Digital Printing, Heat transfer printing Effluent Treatment – Pollution created by the processing unit, Process sequence in Effluent treatment Plant.

**Text Book(s)**

1. Textile Chemistry, Paters R.H, Elsevier Publishing , 1967.
2. Technology of Textile Processing, Shenai V.A., Sevak publications, Bombay, 1981.
3. Textile Finishing , Shenai.V.A. Sevak Publications, Mumbai, 1999.
4. Functional Finishes, Menachem Lewin and Stephen B. Sello, Marcel Dekker, Inc., 1984.
5. Textile Finishing, R.S.Prayag, Shree J Printers, India, 1994.

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://textilecourse.blogspot.com/2018/08/working-process-printing->
2. <http://www.neoakruthi.com/blog/etp-for-textile-industry.html>
3. <https://textilelearner.blogspot.com/2011/08/flow-chart-of-wet-processing-process.html>
4. <https://www.textileschool.com/343/fabric-wet-processing-techniques/>
5. <https://www.fibre2fashion.com/industry-article/1699/special--finishes-to-garment-an- overview>

**Course code**                    **TEXTILE WET PROCESSING PRACTICAL**

**Core Practical-VII**

**Basic knowledge about knit fabric**

**Course Objectives:**

The main objectives of this course are to:

1. To gain a practical on-hand training on preparatory process.
2. To understand the technical importance of wet processing.
3. To plan various process requirements for dyeing.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Prepare the samples by pre-treatment process and calculate weight loss percentage.
2. Formulate the recipe for the fabric sample dyeing
3. Produce the sample by formulated recipe and calibrate shade percentage.

Preparation of samples for Processing:

- Desizing
- Scouring
- Bleaching
- Mercerising

Dye the given fabric using suitable dye:

- Direct Dye
- Sulphur Dyes
- Vat Dye
- Disperse Dye
- Reactive Dyes
- Acid Dye
- Naphthol Dyes
- Basic Dyes

Printing the given fabric using suitable Printing Paste:

- Direct style of printing
- Discharge style of printing
- Resist style of printing



**Text Book(s)**

1. AATCC Garment wet processing Technical manual (1994)
2. Textile processing and properties, Preparation, Dying, Finishing & Performance, Tyrone L.
3. Vigo, elsewhere publishing, Netherland
4. Textile Wet processing, Manoj Dole, Manoj Dole Publications Co. India (2018)

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

- 1 <https://britannica.com/topic/textile/dying-and-printing>
- 2 <https://www.sciencedirect.com-topics/engineering/dying-process>

**Course code**

**APPAREL COSTING & MERCHANDISING**

**Core VII**

**Basic knowledge in garment production processes**

**Course Objectives:**

The main objectives of this course are to:

1. Impart learning about principles of costing and budgeting
2. Impart learning about costing procedure for various garment styles
3. Impart learning about costing procedure for export and domestic products
4. Instruct about roles & responsibilities of merchandiser
5. Describe about planning & programming in execution of an order

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Infer about the elements of cost in pricing apparels
2. Generalize the process involved in budgeting.
3. Estimate the fabric cost in apparel production
4. Summarize order sheet and maintain record in garment production unit.
5. Prioritize the promotional aids for retail and whole sale apparel marketing

**Unit:1 Elements of Cost**

Principles of costing - requirements of good costing system - cost unit - types of costs - Elements of cost - direct material cost - direct expenses - direct wages - indirect materials – indirect expenses - indirect labour-overheads—prime cost-work cost-cost of production – total cost. INCO terms & its relationship with costing

**Unit:2 Budgeting**

The budgeting process: Budgeting principles for the apparel industry- Fixed vs. variable budget - Master budget-laminations of budgets- any justification effort -Planned Vs Actual Cost.

**Unit:3 Fabric Cost Estimation**

Cost estimation of yarn, knitted fabric, dyeing, printing & finishing. Woven Fabric Costing: fabric types, yarn consumption, weaving price Cost estimation for cutting, stitching, checking, packing, forwarding, shipping, and insurance.cmt calculation-fod costing-fright on board costing

**Unit:4 Order Sheet & Documentation**

Order sheet and its contents – Packing list and its contents – Document formats: order sheet, packing list, invoice, inspection and testing reports etc., - Assortment and its types. Documents recording and maintenance – Claims and reasons for claims - Factory audits – Buyer’s code of conducts.

## **Unit:5 Product Promotion**

Advertising- scope, importance, types, merits & demerits; sales promotion, personal selling. Retail management. Export associations – Apparel Export Promotion Council – Journals and magazines related to apparel and textiles –Trade shows and Fairs – Participation in trade shows – Advantages of trade shows and fairs - Apparel & Textile Trade shows and fairs in India.

### Text Book(s)

1. Apparel Costing, M. Krishnakumar, Abhishek Publications 2015
2. Apparel Costing, Andrea Kennedy, Andrea Reyes, Francesco Venezia, Bloomsbury Visual Arts, 2020
3. Apparel Costing, A functional Approach, Krishnakumar, M, Abishek Publications, Chandigarh, 2012

### Related websites

1. <https://www.toppr.com/guides/fundamentals-of-accounting/fundamentals-of-cost-accounting/elements-of-cost/>
2. <https://corporatefinanceinstitute.com/resources/knowledge/finance/budgeting/>  
<https://efinancemanagement.com/budgeting>
3. <https://theinvestorsbook.com/pricing-methods.html>
4. <https://www.yourarticlelibrary.com/marketing/pricing/pricing-objectives-top-5-objectives-of-pricing-explained/48639>

**Course code**

**WOMEN'S APPAREL PRACTICAL**

**Core Practical-VI**

**Basic knowledge about knit fabric**

**Course Objectives:**

The main objectives of this course are to:

1. Design Garments for women
2. Impart Skills in pattern drafting
3. Construct garments by sewing

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Design and generalize the measurements for the various women's' garments.
2. Prepare patterns and calculate material requirement for the designed women' s wear.
3. Construct the designed women's garment and calibrate the cost of the garment.
4. Calculate the material required –Layout method and Direct measurements method

**List of experiments**

1. Saree Petticoat- Six Panel, Decorated bottom.
2. Skirts – Circular/umbrella/panel with style variations.
3. Blouse- front open, Fashioned neck, Waist band at front, with sleeve. 4.Salwar (or) Churidhar (or) Parallels (or) Bell Bottom
4. Kameez – with /without slit, with or without flare ,with /without opening ,with or without panels, with /without yoke.
5. Nightie –With yoke, front open , with sleeve , full length.
6. Ladies pant- waist band , zip attached ,tight fitting / parallel pants.
7. Short kurta / top – Decorative / surface design in tailored placket, with or without collar.

**Text Book(s)**

1. Scientific garment quality –K M Illege and Sons , Plot No. 43 , Somuvar Peth pune411011
2. Practical Clothing Constructing-Part I and II, Mary Mathews, Cosmic Press, Chennai(1986)
3. Dress making- Smt Thangam Subramaniam Bombay Tailoring and embroidery college32

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1 <https://www.patternsonline.com-default.aspx>

2 <https://shoeguide.com/>

Course code

**EMBROIDERY & ACCESSORIES MAKING PRACTICAL  
SBEC-I**

**Basic knowledge about knit fabric**

**Course Objectives:**

1. To impart knowledge to the students about the hand and machine embroidery.
2. To learn the various types of stitches.
3. To provide opportunity for skill development in designing accessories.
4. To impart knowledge on fashion accessories & creativity.

**Expected Course Outcomes:**

1. On the successful completion of the course, student will be able to:
2. Produce the hand and machine embroidery samples
3. Prepare decorative samples using beads or mirrors or sequins or etc.,
4. Develop complex fashion accessories by learning to design different accessories manuallyA.

**Prepare samples for the following**

- Hand embroidery – 20 stitches -10 samples
  - Machine embroidery -7stitches -3 samples.
  - Applique ( machine / hand )- 3 types
  - Smocking – 4 types
  - Bead Work -1 sample
  - Sequins work -1 sample
  - Zardosi work -1 sample
  - Tassels and fringes -2-3samples.
  - Mirror work –Shapes (Round, square, diamond) - 3 samples
  - Fixing the stones-1 sample.
- B. Traditional surface ornamentation practices with two to four variations in the following,
- Kantha
  - Chikan
  - Kasuti
  - Zardosi
  - Kutch work
  - Mirror work
  - Aari work
  - Phulkari work.
- C. Crocheting
- In embroidery practical add
  - Hand bag - Any 3 types
  - Hat - Any 2 types
  - Bow - Decorative bow & formal bow
  - Purse & pouches - any 2 types

**Text Book(s)**

1. Scientific garment quality –K M Illege and Sons , Plot No. 43 , Somuvar Peth pune411011
2. Shailaja D. Naik, Traditional embroideries of India, APH Publishing (1996 )
3. Dress making- Smt Thangam Subramaniam Bombay Tailoring and embroidery college32
4. Libby Moore Thread folk, a Modern Maker’s book of Embroidery, Project & Artist Collaboration, Paige Tata & Co.

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

- 1 <https://sueguide.csom/smocking/>

**Course code**

**FASHION BUSINESS  
NMEC-II  
Have basic knowledge in Fashion Business**

**Course Objectives:**

The main objectives of this course are to:

1. To make the learners to know the basic communication process.
2. To understand fashion communication process

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Infer about Fashion Communication Process and its types
2. Interpret the Fashion Communicative devices in commercial publicity
3. Explain development of specific communication skills

**Unit I Basic Communication**

Fashion Communication Process, Problems and Networks. Fashion Verbal Communication. Language as a vehicle of communication, Non-Verbal Communication.

**Unit II Inter Personal communication**

Study and practical of inter-personal, small group and presentation skills essential to effective social, business and professional interaction. Fashion Communicative devices in commercial publicity: letter styles, designs, pictorial presentation, slogans, colour variations.

**Unit III Cultural and Inter cultural Communication**

Cultural and intercultural communication theory and behaviour, development of specific communication skills for effective inter-cultural communication. Unit IV Group Discussions Principles and methods of modern group discussions, press conferences, interviews, seminars.

**Unit V Fashion Business**

Business of fashion, Scope, forms of business ownership, growth and expansion. Industry trends, Market weeks, Trade shows, Development of regional fashion centres, Fashion advertising.

**Text Book(s)**

1. Fashion Sketch Book – Bina Abling, Fair Child Publications, New York Wardrobe, 1988.
2. Fashion from Concept to Consumer – Frings Gini Stephens, Pearson Education, US, 1998.
3. Inside the Fashion Business – Kitty G. Dickerson, Pearson Education, US, 2007.

## **Related Online Contents**

1. <https://www.apparesearch.com/terms/index.html>
2. <https://www.instyle.com/fashion>
3. <https://prezi.com/1tlwgnhviqs-/fashion-elements-and-principles-of-design/>

**Course code**                      **CORE IV - NON WOVEN & TECHNICAL TEXTILES**

**CORE IV**

**Have basic knowledge in Textiles**

**Course Objectives:**

The main objectives of this course are to:

1. Impart knowledge on design concepts in the field of fashion
2. Familiarize with the fashion cycles, consumers and theories
3. Design suitable garments for unusual figure types

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Infer about design and its types
2. Interpret the principles of design and its applications
3. Explain color theory and color schemes.
4. Generalize the designing concepts for unusual figures.
5. Justify wardrobe planning and list out the factors for fabric selection

**Unit:1 Design and its types**

Non – woven – Introduction – definition, classification and scope and application of non woven – fibres used- web preparation, opening, cleaning machine, production of parallel laid web, cross laid and random laid web.

**Unit:2 Principles of design**

Bonding methods – mechanical, thermal, chemical/ adhesive, melt blown and spun lace techniques. Finishing of bonded fabrics. Fusing –methods of fusing. Braiding – methods of braiding. Netting – methods, lacing.

**Unit:3 Color theory**

Technical Textiles – Introduction, definition, scopes & importance and uses. Application of Agro Tech, Build Tech, Cloth Tech, Home Tech, Indu Tech, Medical Tech, Sports Tech, Pack Tech, Mobile Tech, Protect Tech, Geo Tech

**Unit:4 Designing dresses for unusual figures**

Medical Tech, Sports Tech, Protective – introduction, general properties and end uses.

**Unit:5 Wardrobe Planning**

Smart & intelligent textiles, Smart – Active smart, passive smart & ultra smart, Intelligent – PCM, SMP, Chromic & conductive materials

Text Book(s)

- 1 Non woven bonded fabrics – Lunenscholss J and W Albrocht, Ellis Horwood, London 1985
- 2 Non – Wovens – Arul Dahiya, MG Kamath, Raghavendra R Hedge and Monika Kannadnguli



- 3 Geo Textiles – NWM John, Blackir London.
- 4 Family Clothing – Tate and Glisson, John Wiky and Sons., Illinas, 1963
- 5 Textiles – Anand and A.R. Horracks, Textile Institute

**FIFTH  
SEMESTER**

Course code

COMPUTER & TEXTILES IN GARMENT DESIGN

CORE VI

Knowledge and skills in manual pattern

**Course Objectives:**

The main objectives of this course are to:

1. Acquire skills in developing patterns through computer software.
2. To understand the basics of CAD software
3. Drafting, Grading and Marker planning of garment patterns using new advance software.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

Draft the pattern for various kid's, women's and men's wear

Grade the pattern blocks into various sizes.

Create marker planning for the pattern for cutting with higher efficiency

**Unit: 1 Introduction to computers**

Introduction to computers –Organization of Computers –Input Unit, Output Unit, Central Processing Unit ,Memory Devices, Working Principles of Printer-Scanner, Digitizer & Plotter

**Unit: 2 Computer Application in Textile Designing**

Computer Application in Textile Designing- Weaving- Softwares used – Types of woven Design- Dobby and Jacquard- Techniques Used. Knitting - Softwares used – Types of knitting. Printing – Creation of Printed Design – Simulation Technique.

**Unit: 3 Computer Application in Fashion Designing**

Computer Application in Fashion Designing-Design Creation- Theme Rendering- 3D Modeling- Body Scanning-Texture Mapping-Design Studio- Fashion Studio- Fashion Multimedia Concepts

**Unit: 4 Computer Application in Pattern Making**

Computer Application in Pattern Making- Process involved in Pattern Making Grading-Marker Planning-Laying-Cutting- Labelling-Duplicating. Computerized Sewing Machine

**Unit: 5 Computer Aided Manufacturing**

Computer Aided Manufacturing – Concepts of Computer Integrated Manufacturing – Definition and Functions of CAD, CAM, CIM, CAA, PDC . Computerized Embroidery Machines. Computerized color Matching System. Brief study of Designing Soft wares used in textile industry.

**Contemporary Issues**

Expert lectures, online seminars – webinars

**Text Books**

1. Pattern Cutting For Clothing Using Cad: How To Use Lectra Modaris Pattern Cutting Software - Stott M, Woodhead Publishing Ltd, 2012
2. Pattern Cutting And Making Up Revised Edition - Shoben M M , CBS Publishers and Distributors, 2000
3. Computer Aided Design & Manufacturing (Test CAD Programs Inside), Sadhu Singh, Khanna Publications, 1998.

**Course code**                      **COMPUTER APPLICATION IN GARMENT DESIGNING PRACTICAL**  
**Core- Practical VIII**

**Knowledge and skills in manual pattern**

**Course Objectives:**

The main objectives of this course are to:

1. Acquire skills in developing patterns through computer software.
2. To understand the basics of CAD software
3. Drafting, Grading and Marker planning of garment patterns using new advance software.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Draft the pattern for various kid's, women's and men's wear
  2. Grade the pattern blocks into various sizes.
  3. Create marker planning for the pattern for cutting with higher efficiency
- Draw the dress design using Corel draw software
  - Draw the dress design using adobphotoshop software

**Children's wear**

Draft and grade patterns for the following garments. Create marker plans and conduct fit analysis for the following garments

- Yoke frock
- Baba suit
- Summer frock
- Skirt and tops

**Women's wear**

Draft and grade patterns for the following garments. Create marker plans and conduct fit analysis for the following garments

- Salwar
- Kameez
- Tops
- Nighty

**Men's wear**

- Draft and grade patterns for the following garments. Create marker plans and conduct fit analysis for the following garments

- Full sleeve shirt
- T-Shirt
- BermudasPleated trouser

1 <https://medcraveonline.com/JTEFT/various-approaches-in-pattern-making-for-garment-sector.html>

2 [https://www.youtube.com/watch?v=jTWtQNTJt\\_A](https://www.youtube.com/watch?v=jTWtQNTJt_A)

3 <https://www.youtube.com/watch?v=iX7O4X7O4fNQijA>

**Course code**                    **APPAREL COSTING & MERCHANDISING**

**Core VII**

**Basic knowledge in garment production processes**

**Course Objectives:**

The main objectives of this course are to:

1. Impart learning about principles of costing and budgeting
2. Impart learning about costing procedure for various garment styles
3. Impart learning about costing procedure for export and domestic products
4. Instruct about roles & responsibilities of merchandiser
5. Describe about planning & programming in execution of an order

Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1. Infer about the elements of cost in pricing apparels
2. Generalize the process involved in budgeting.
3. Estimate the fabric cost in apparel production
4. Summarize order sheet and maintain record in garment production unit.
5. Prioritize the promotional aids for retail and whole sale apparel marketing

**Unit:1 Elements of Cost**

Principles of costing - requirements of good costing system - cost unit - types of costs - Elements of cost - direct material cost - direct expenses - direct wages - indirect materials – indirect expenses - indirect labour-overheads—prime cost-work cost-cost of production – total cost. INCO terms & its relationship with costing

**Unit:2 Budgeting**

The budgeting process: Budgeting principles for the apparel industry- Fixed vs. variable budget - Master budget-laminations of budgets- any justification effort -Planned Vs Actual Cost.

**Unit:3 Fabric Cost Estimation**

Cost estimation of yarn, knitted fabric, dyeing, printing & finishing. Woven Fabric Costing: fabric types, yarn consumption, weaving price Cost estimation for cutting, stitching, checking, packing, forwarding, shipping, and insurance.

**Unit:4 Order Sheet & Documentation**

Order sheet and its contents – Packing list and its contents – Document formats: order sheet, packing list, invoice, inspection and testing reports etc., - Assortment and its types. Documents recording and maintenance – Claims and reasons for claims - Factory audits – Buyer’s code of conducts.

## **Unit:5 Product Promotion**

Advertising- scope, importance, types, merits & demerits; sales promotion, personal selling. Retail management. Export associations – Apparel Export Promotion Council – Journals and magazines related to apparel and textiles –Trade shows and Fairs – Participation in trade shows – Advantages of trade shows and fairs - Apparel & Textile Trade shows and fairs in India.

### Text Book(s)

1. Apparel Costing, M. Krishnakumar, Abhishek Publications 2015
2. Apparel Costing, Andrea Kennedy, Andrea Reyes, Francesco Venezia, Bloomsbury Visual Arts, 2020
3. Apparel Costing, A functional Approach, Krishnakumar, M, Abishek Publications, Chandigarh, 2012

### Related websites

1. <https://www.toppr.com/guides/fundamentals-of-accounting/fundamentals-of-cost-accounting/elements-of-cost/>
3. <https://corporatefinanceinstitute.com/resources/knowledge/finance/budgeting/>
4. <https://efinancemanagement.com/budgeting>
5. <https://theinvestorsbook.com/pricing-methods.html>
5. <https://www.yourarticlelibrary.com/marketing/pricing/pricing-objectives-top-5-objectives-of-pricing-explained/48639>



**Course code**

## **TEXTILE FINISHING**

### **Core VIII**

#### **Basic knowledge in garment production processes**

Course Objectives:

1. To impart knowledge & understanding of chemistry, mechanism & application process of various textile finishes.
2. It aims to enhance the awareness of future trends in textile finishing.
3. To impart the knowledge about finishing methods of fabric based on their function.

Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1. Distinguish the method & application of finishes on different textile substrates.
2. Generalize the process sequence of mechanical finishes on textile materials.
3. Interpret the functional finishes on textile materials
4. Infer about the advanced finishes carried out on textiles
5. Discover the special finishes on textile materials.

#### **Unit:1 Finishing**

Finishing - Introduction – Objects of finishing, Importance of finishing, Classification of finishes, Advantages of finishing.

#### **Unit:2 Mechanical Finishing**

Mechanical Finishes- Beetling, Shearing, Calendaring, Tentering, Moiering, Embossing, Glazing, Napping, Chemical Weighting of Silk, Sizing, Sanforizing, Schreinerling, Wrinkle free finish.

#### **Unit:3 Functional Finishing**

Functional Finish - Resin finish, Water Proof finish, Water Repellent finish, Antimicrobial finish, Flame Retardant finish, Soil Release finish - Process and Recipe, Types and Method of Fusing, Welding and Adhesives, Molding.

#### **Unit:4 Advanced Finishes**

Advanced Functional Finish - Stiff finish - Process and Recipe, Softening - Silicone finish, Denim finish, Stone Wash finish, Anti - Pilling finish, Anti Mildew finish.

#### **Unit:5 Special finishes**

Special Finishes On Garments– Finishing of Woven/Knitted garments– Stoneless, Stone Wash effects– Mud wash, Ion wash, Chalk wash, Water resistant Breathable finish, Bio polishing, Leathery Finish, Protective Finishes– Deodorizing, Cool Finish and Thermo stat finishes.

#### **Text Book(s)**

1. Shenai and Saraf. 1995. Technology of Textile Finishing. Sevak publications.

- 2 NallangilliandJayaprakasam.2005.TextileFinishing.S.S.MInstituteofTextile Technology.
- 3 Prayag.1996.Technologyoffinishing.ShreeJ.Printers,Pune

Related websites

- 1 <https://nptl.ac.in/courses/116/102/116102054/>
- 2 [https://ugcmoocs.inflibnet.ac.in/ugcmoocs/view\\_ug.php/130](https://ugcmoocs.inflibnet.ac.in/ugcmoocs/view_ug.php/130)

**Course code**

**INTERNSHIP TRAINING (Viva-voce)**

### **Core Practical- IX**

**Gain Practical insights of the industry / company**

#### **Course Objectives:**

The main objectives of this course are to:

1. Expose the students to the work environment
2. Familiarize and adapt to the workplace
3. Understand the methods, techniques and practices followed in the place of training

#### **Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Generalize working structure of the industry/ company
2. Analyze the methods adopted in the training place
3. Recognize the challenges in the training place
4. Discover the nuances of the workplace and appreciate it

No CIA, Report: 80 marks and Viva: 20 marks

#### **Details of the Training**

The student should undergo 15 Days Internship training in a Textile Processing Unit/ Designer House / Buying House/ Garment Unit / Retail house after IV semester theory exam / before the start of Fifth Semester (Total Marks – 50, No CIA, Report: 80 marks and Viva: 20 marks)

#### **Purpose of the Internship Training**

The training bridges the gap between the theoretical knowledge gained in the college and the practical application of the same in the industry / company / stores. The student will have a better exposure about the workplace and its nuances.

#### **Process to be Followed**

Students can identify their area of interest. Industry / companies have to be identified and a profile of the company has to be analysed at least a month earlier. Contacts can be established by the guides allotted to the student. Prior permission has to be obtained from the place of training.

After confirmation, the student will undergo training for a period of 15 working days.

#### **Instructions to the Students**

The students should abide by the rules and regulations of the concern and get the maximum benefit from the training. The students should maintain a daily logbook where the student should record his details of the training.

A copy of the record has to be sent to the supervisor allotted to the student. The logbook must be signed (with seal) by the staff of the company. Based on the study done, the student will submit a report to the guide within a weeks' time along with the logbook. Incase of any problems, the student should reach out to the supervisor immediately

### **Instructions to the Supervisor**

The supervisor should establish contacts with the place of training. A routine follow up has to be done with the student once in two or three days. Problems, if any faced by the student should be sorted out immediately.

### **Training Report and Presentation**

Training Report (30 – 50 pages) should be prepared by the student and submitted in a month's time. At the end of the semester student should present the report with a power point presentation

### **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

- 1 <https://www.wikihow.com/Write-a-Report-After-an-Internship>
- 2 <http://mfe-iseah-kef.blogspot.com/2013/11/internship-daily-journal.html>
- 3 [https://www.academia.edu/25257761/Student\\_Internship\\_Logbook](https://www.academia.edu/25257761/Student_Internship_Logbook)
- 4 <https://www.indeed.com/career-advice/career-development/how-to-write-an-internship-report>
- 5 <https://valenciacollege.edu/students/internship/documents/ActivityLog.pdf>
- 6 <https://www.template.net/business/log/internship-time-log/>

**Course code**

**MENS APPAREL RACTICAL**

**Core Practical-X**

**Basic Knowledge about Men's apparel designing**

**Course Objectives:**

1. To impart the practical knowledge in pattern drafting & garment construction skill in men's wear for the Students.
2. To develop creative skills in designing & constructing men's wear for different age group
3. List the measurements required and materials suitable.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Design and generalize the measurements for the various men's garments.
2. Prepare patterns and calculate material requirement for the designed men's wear.
3. Construct the designed men's garment and calibrate the cost of the garment.

1. S.B.Vest – with/ without collar, button attached, sleeveless
2. Slack shirt – full open, shirt collar, patch pocket,
3. Nehru kurtha –stand collar, side pocket, half open
4. Pyjama- Elastic /Tape attached waist.
5. Pleated trousers – pleats in front, Darts at back, side pocket, fly with button/zip.
6. T-Shirt – open collar, zip attached
7. Bermudas –patch pocket

**Text Book(s)**

1. Practical Clothing Constructing-Part I and II, Mary Mathews, Cosmic Press, Chennai(1986)
2. Zrapker System of Cutting- Zrapker. K. R, Navneet Publicationsltd.

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://shoeguide.com/>
2. <https://www.patternsonline.com-default.aspx>

**Course Code**

**Entrepreneurship Development  
MBEC-I**

**Basic knowledge about apparel business Opportunities**

**Course Objectives:**

The main objectives of this course are to:

1. Familiar the students with challenges of starting new ventures
2. Enable them to investigate, understand and internalize the process of setting up a new business.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Outline the concept of entrepreneurship and traits of entrepreneur
2. Identify a project and formulate a project report.
3. Appraise the formalities of SSI's Registration for an enterprise
4. Identify the Sources of Finance and Institutional Assistance for small scale industries.
5. Infer about entrepreneur, Incubation centers and start up in India

**Unit:1 Introduction to Entrepreneurship**

Entrepreneurship: Concept and Definitions; Entrepreneurship and Economic Development; Classification and Types of Entrepreneurs; Entrepreneurial Competencies; Factor Affecting Entrepreneurial Growth – Economic, Non-Economic Factors; EDP Programmes; Entrepreneurial Training; Entrepreneur; Manager Vs. Entrepreneur.

**Unit:2 Starting the venture**

Project Identification – Project formulation – Project design - preparing project report - Project Planning and Scheduling using Networking Techniques of PERT / CPM; Methods of Project Appraisal.

**Unit:3 SSI and Registration**

Small Enterprises and Enterprise Launching procedures and Formalities Role of SSI in Economic Development of India; SSI; Registration; NOC from Pollution Board; project report presentation guidelines

**Unit:4 Sources of Finance and Institutional Assistance**

Role of Support Institutions and Management of Small Business: Director of Industries; DIC; SIDO; SIDBI; Small Industries Development Corporation (SIDC); SISI; NSIC; NISIET, NIESBUD; TANSIDCO; TIIC; State Financial Corporation; KVIC

**Unit:5 Financial incentives for SSI**

Financial incentives and subsidies for SSI's, and Tax concessions; – seed capital assistance –Role of entrepreneur in export promotion and import substitution – Social Entrepreneur, Incubation centre, Startup India

#### Text Book(s)

1. Entrepreneurial Development, Dr. C.B. Gupta, Sultan Chand & Sons, New Delhi, 2009
2. Entrepreneurial Development, Dr.S. S Khanka, Sultan Chand & Sons, New Delhi, 2009.
3. Entrepreneurship Development and Small Business Enterprises, Charantimath, Poornima,
4. Pearson Education, New Delhi, 2006
5. Entrepreneurship New Venture Creation, David H. Holt, Prentice Hall of India Private Limited, New Delhi, 2005

#### Related Websites

1. <https://www.researchgate.net/publication/259843889>
2. <https://ncert.nic.in/textbook/pdf/kebs109.pdf>

SIXTH  
SEMESTER



Course code

## **KNIT SCIENCE**

### **Core Practical-IV**

#### **Basic knowledge about knit fabric**

Course Objectives:

1. To impart knowledge on woven fabrics
2. To help students understand fabric formation process.
3. To impart knowledge on woven fabric Designs and Structures. The main objectives of this course are to
4. Identify the loop structure of the fabric
5. Identify different types of knitted fabric sample
6. Identify fabric defects, its cause and work on the remedies

#### **Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Discover loop structure and graphical representation of weft knit fabrics
2. Determine the loop structure and graphical representation of warp knit fabrics
3. Classify the different defects from the knitted fabrics.

#### **Unit-I Different fabric forming methods**

Different fabric forming methods-Comparison of weaving and knitting- Principles of weft and warp knitting – Comparison of weft and warp knitting – Classification of knitting machines - Yarn passage diagram of a circular knitting machine – Knitting machine elements and description - Knitting cycle of latch needle with sinker.

#### **Unit-II Knitting terms and definitions**

Knitting terms and definitions - Principal weft knit stitches - Knit, tuck and miss stitch formation and properties - Representation of weft knit stitches – Study of Basic weft knit structures - Needle gating - Description of circular Rib & Interlock knitting machine – Characteristics of basic weft knit structures – Circular knitting GSM and production calculations.

#### **Unit-III Single jersey knit fabric structures**

Single jersey knit fabric structures, their cam and needle order: Plain jersey, Pique, Thick pique, Honey comb, Pearl and Twill. Rib fabric structures, their cam and needle order: 1x1 rib, 2x2 rib, Drop needle, Royal rib, Polka rib, Double half cardigan, Double cardigan, Milano rib, Waffle, Flat back, Swiss double pique and French double pique. Interlock fabric structures, their cam and needle order: Interlock, Eight lock, Ottoman rib, Pin tuck, Texi pique and Ponte di Roma.

#### **Unit-IV Jacquard knitting**

Jacquard knitting - Needle selection techniques – Pattern jack, Pattern wheel, Pattern drum and Computerized jacquard knitting machines – Brief study on specialty weft knit structures – Auto stripe

yarn programming – Elastomeric yarn insertion and effects – Knitted fabric faults – Causes and Remedies.

### **Unit-V Flat Knitting**

Flat Knitting – Yarn passage diagram of a flat knitting machine – Mechanical type Flat knitting machine - Needle bed assembly – Racking, Carriage and Cam box arrangement - Transfer Stitch and Drop Stitch – Thread diagram, effects and applications – Introduction to computer controlled Flat knitting machine. Concept of fully-fashioned machines and seamless knitwears. Introduction to warp knitting – Warp knitting terminologies – Open lap and closed lap. Knitting action of Tricot and Raschel machines. Comparison of Tricot and Raschel machine.

### **Text Book(s)**

1. D.B. Ajgaonkar, Knitting Technology
2. David .J.Spencer, Knitting Technology
3. Chandrasekara Iyer et al., Circular knitting technology
4. Dr.Samuel Raz , Flat Knitting
5. Dr.S.Raz, Warp Knitting Technology
6. Peter Lord et al., Fabric forming systems

### **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://textilelearner.blogspot.com/2013/01/faultsdefects-in-knitted-fabrics.html>
2. <https://sciencedirect.com/topic/engineering/knitting-technology>
3. <https://nptl.ac.in/course/116/102/116102008/>

**Course Code**

**APPAREL PRODUCTION MANAGEMENT**

**Core XI**

**Basic knowledge in textile fibers, yarns & fabrics**

**Course Objectives:**

1. The main objectives of this course are to:
2. Instruct about various test for yarns, fabrics & garments
3. Describe about various levels of inspection & its procedure in apparel production
4. Describe about various norms & standards followed in testing and inspection

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Outline the testing procedure for various yarn parameters
2. List out the specifications for various woven & knitted fabrics
3. Differentiate the various systems used for fabric inspection
4. List out the possible defects and its causes in apparel production
5. Differentiate the categories of defects in garment and the various standards followed in apparel testing

**Unit:1 Yarn Testing**

Importance of Quality. Quality terminologies. Testing: Objectives of Testing - atmospheric conditions for testing lab. Identification of textile fibers. Yarn numbering systems – Determination of yarn count. Yarn strength testing & CSP. Testing of yarn evenness, yarn twist & Hairiness measurement

**Unit:2 Fabric Testing**

Knitted fabric specifications – Testing of Dimensional stability, Spirality & Bowing. Testing of colour fastness to washing, rubbing, perspiration & light - Grey scales and ratings. Brief study about testing of woven fabric.

**Unit:3 Raw material Inspection**

Inspection: Incoming and raw material inspection: Fabric inspection – 4-point system. In process/ online inspection: Advantages – On line inspection during spreading, pattern making, cutting, sewing and ironing. Final inspection: Sampling plans and AQL charts – Level of final inspection. Packing & packaging mquality tests. Care labeling and international care symbols.

**Unit:4 Principles of TQM**

Principles of TQM – Deming’s PGDCA Cycle - KAIZAN concepts – 5 „S” applications in apparel industry. Application of seven QC tools in apparel industry.

## **Unit:5 Final Inspection & Standards**

Understanding of ISO 9001:2000 standards: QMS, management responsibility, resource management, product realization and measurement analysis & improvement – Various documents required for ISO 9001:2000 implementation and its contents – Development of quality system manual for garment industry. Documented procedures required for ISO 9001:2000 implementation – Procedures for internal quality audit – Management review meeting – Certification process – Surveillance audit.

### **Text Book(s)**

1. Physical Testing of Textiles, 1st Edition, B P Saville, Woodhead Publishing, 1999
2. Managing Quality in Apparel Industries, Pradeep V Metha & Satish K. Bhardwaj, NIFT, 1998
3. Stamper, Evaluating apparel quality, Sue Humphries Sharp, Linda Donnell & Anitha A Fairchild Books, 1991
4. Textile Testing, Arindam Basu, South India Textile Research Association, 2006

### **Related websites**

1. <http://textilemerchandising.com/quality-assurance-and-quality-control/>
2. <https://insight-quality.com/garment-quality-control-procedures/>
3. <https://garmentsmerchandising.com/acceptable-quality-level-apparel-industry/>
4. <http://texhour.com/aql-and-type-of-defects>

**Course code**                    **ACCESSORIES MAKING PRACTICAL**

**SBEC-I**

**Basic knowledge about knit fabric**

**Course Objectives:**

1. To provide opportunity for skill development in designing accessories.
2. To impart knowledge on fashion accessories & creativity.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Produce the hand and machine embroidery samples
2. Prepare decorative samples using beads or mirrors or sequins or etc.,
3. Develop complex fashion accessories by learning to design different accessories manually

**List of Experiments**

- Hand bag – Any three types
- Hat – Any two types
- Bow – Decorative bow and formal bow
- Belt – For boy and girl
- Foot wear – Any three types 6.Purse and pouches – Any two types
- Hair band and head bands – Any four types
- Watches – Any two types

**Text Book(s)**

1. “Quick style”, by- Christine Kunzerlman
2. 1000 Ideas by fashion designers Carolina Cerime
3. 150 Beaded & motifs Kenneth D King
4. 21st Century Jewellery Mrthe Le Van
5. Accessories options : Shrugs scaxues stoles

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

- <https://sueguide.csom/smocking/>
- <https://www.youtube.com/watch?v=nJz9c8gEvFg>

**Course code**

**INTERNATIONAL TRADE AND DOCUMENTATION**

**MBEC II**

**Basic Knowledge in International trade**

**Syllabus**

**Course Objectives:**

1. To study the Trade procedures and documentation formalities are a critical part of International Business Management.
2. This subject aims at imparting knowledge of trade procedures and documentation formalities.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Outline export promotion council procedures for firm establishment.
2. Infer about the implications of foreign trade policy and its documentations.
3. Generalize the import trade procedures and documentation.
4. Summarize the procedure and formalities of shipment and customs.
5. Interpret the payment procedures and delivery formalities.

**Unit: 1 Firm Establishment**

Firm establishment: introduction – export promotion councils and their role – registration Formalities - RCMC –IE code – RBI code – garment classification and categories for various countries – quota – quota distribution methods – quota transfer.

**Unit: 2 Foreign Trade Documents**

Foreign trade documents: need, rationale and types of documents relating to goods – invoice – packing note and list – certificate of origin – certificate relating to shipments – mate receipt – shipping bill – cart ticket – certificate of measurement – bill of lading – air way bill – documents relating to payment – letter of credit – types of L/C - bill of exchange – letter of hypothecation – bank certificate for payment – document relating to inspection – certificate of inspection – GP and other forms.

**Unit: 3 Import Procedure**

Import procedure : import license – procedure for import license – import trade control regulation procedure – special schemes – replenishment license – advance license – split up license – spares for after sales service license – code number – bill of entry

**Unit: 4 Shipment & Customs**

Shipment and customs: Pre-shipment inspection and quality control – foreign exchange formalities – Pre-shipment documents - documentation terms - excise and customs clearance of export cargo – shipment of goods and port procedures – customs clearance of import cargo. Post – Shipment formalities and procedures – claiming duty drawback and other benefits.

## **Unit: 5 Payment and Deliveries**

Payment and deliveries: terms of delivery– INCO terms – EXW – FCA – FOB – CFR – CIF – CPT – DAF – DDP – DDU. Terms of payment – open account – cheque – cash payment against documents – bank payment against documents (LC) – security and Cost of various payment terms – Assessing the risk in payment – role of ECGC and standard policy.

### **Text Books**

- International Trade and Documentation, Edward G Hinkelman, Publisher: World Trade Press 2001.
- Streamline Your Export Paper Work, Bose. A., Published by International Trade Form, Oct – Dec 1965.
- Export and Import Management, Aseem Kumar, Excel Publications, 2007.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1. <https://www.marketresearchreports.com/apparel-retailing>
2. <https://smallbusiness.chron.com/analysis-retail-apparel-industry-70514.htm>
3. <https://www.marketresearch.com/Consumer-Goods-c1596/Consumer-Goods-Retailing-c80/Apparel-Retailing-c1093/>

**Course code**                    **PORTFOLIO PRESENTATION-VIVA VOCE**  
**SBEC II**

**Knowledge in creating various garments**                    **Syllabus**

**Course Objectives:**

The main objectives of this course are to:

1. To design and execute an organized collection of creative works
2. To make original works of art that demonstrates effective use of design principles, appropriate crafts man ship and technique.
3. Design collections by fulfilling the objectives of the client and user requirements.

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Select a theme for different garment categories.
2. Create different portfolio boards for selected theme.
3. Construct the garments for all deigned categories.

Portfolio Presentation and Design Collection

**Part A**

- Portfolio Presentation - with Customer profile, Inspiration board, Mood Board, Colour board, Flat Sketch board, Illustration board, Swatch board, Trim board, Accessory board- for the following collection
- Fashion Show- with a theme – one ramp set
- Winter collection - 3garments
- Summer Collection -3 garments

Note

- Customer profile: capture photograph of your customer.
- Inspiration board: Image collection from books and magazines by scanning, Photography and drawing, use of objects for mood creation
- Mood board: develop a theme based on group discussion, mind mapping, brain storming.
- Colour board: spotting theme board, mood board and inspiration board arrive the color board.
- Flat sketch board: Develop front, side and back views

**Part B**

- Construct the garments for all the above categories
- Contemporary Issues
- Expert lectures, online seminars – webinars



## **Text Books**

1. Portfolio Presentation for Fashion Designers, Linda Tain, Fairchild Publishers (1998)
2. Fashion Design Drawing and Presentation, Patrick John Ireland, B T Batsford Ltd, 2006
3. Creative Fashion Presentation, Polly Guerin, Fairchild Publishers, 1987
4. New Encyclopedia of Fashion Details, Patrick John Ireland, Publisher: Pavilion Books, 2008
5. Check and Stripe: A Design-Source Book 2, Kyoto Shoin Company Ltd. 1992

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

- 1 [https://issuu.com/theodoracucu/docs/portfolio\\_internship\\_ba](https://issuu.com/theodoracucu/docs/portfolio_internship_ba)

**Course code**

**Beauty Care Practical**

**SBEC-III**

**Basic Knowledge about Makeup**

**Course Objectives:**

1. Produce a capable & skillful workforce as required by the prevailing market demands.
2. Equip the trainees with skills & knowledge to ensure adherence to safety measures in saloon.
3. Select, operate and handle equipment according to the professional standards

**Expected Course Outcomes:**

On the successful completion of the course, student will be able to:

1. Create various techniques used in beauty care
2. Design traditional and modern style makeup using different equipments.
3. Practice beauty techniques and procedures for different occasions.

**List of Experiments**

1. Different types of haircuts, cutting techniques & blow drying of hair.
2. Traditional hair styling techniques- Rolls, Braids, interlocks, Twisting styles.
3. Henna designing, Tattoo designing & saree draping (4styles).
4. Basic Nail art techniques.
5. Facial -Skin analysis, cleaning & facial with different equipments,
6. Application of different types of packs & masks according to the skin types.
7. Different types of makeup - Daytime, Evening, Party & Bridal.
8. Pedicure & manicure.
9. Threading & waxing
10. Bridal Makeup

**Text Books**

1. Complete Beautician Course by Renu Gupta
2. Be your own Beautician by Parvesh Handa
3. Advance makeup and hairstyle by Urvashi Dave

**Related Online Contents**

1. <https://bit.ly/2DB2WQM>  
<https://youtu.be/sYoz3G2OH5g>  
[https://youtu.be/\\_o9cpvQPqBY](https://youtu.be/_o9cpvQPqBY)