

MAHARSHI DAYANAND UNIVERSITY, ROHTAK
SCHEME OF STUDIES & EXAMINATIONS
B.Tech 3rd YEAR TEXTILE CHEMISTRY (TC)
5th SEMESTER
Proposed 'F' Scheme w.e.f 2011-12

| Course No. | Course Title | Teaching Schedule | | | | Marks of Class work | Examination | | Total Marks | Duration of Exam |
|--------------|---|-------------------|----------|-----------|-----------|---------------------|-------------|------------|-------------|------------------|
| | | L | T | P | Total | | Theory | Practical | | |
| TT-301-F | Structure & Properties of Fibres (common with TT) | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| TC-303-F | Technology of Dyeing | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| TC-305-F | Chemistry of Dyes | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| TT-307-F | Textile Testing-I (common with TT) | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| TC-309-F | Textile Design | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| TT-311-F | Garment Manufacturing Technology (Common with TT) | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| | | | | | | | | | | |
| | Practicals | | | | | | | | | |
| TC-313-F | Dyeing Lab-I | - | - | 3 | 3 | 50 | - | 50 | 100 | 4 |
| TC-315-F | Technical Analysis Lab | - | - | 3 | 3 | 50 | - | 50 | 100 | 4 |
| TT-317-F | Textile Testing Practical-I (common with TT) | - | - | 2 | 2 | 50 | - | 50 | 100 | 4 |
| TT-319-F | Pattern Cutting & Making-Up (common with TT) | - | - | 2 | 2 | 50 | - | 50 | 100 | 4 |
| Total | | 18 | 6 | 10 | 34 | 500 | 600 | 200 | 1300 | |

TT-301-F STRUCTURE AND PROPERTIES OF FIBRES (COMMON WITH TT)

| | | |
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| L | T | P |
| 3 | 1 | - |

| | | |
|-------------------|---|-------|
| Classwork | : | 50 |
| Examination | : | 100 |
| Total | : | 150 |
| Duration of exam: | | 3 hrs |

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

TC-303-F TECHNOLOGY OF DYEING

L T P
3 1 -

Classwork : 50
Examination : 100
Total : 150
Duration of exam: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

UNIT – I

Introduction to textile dyes – general classification, Colour Index and nomenclature of commercial dyes.

Direct dyes- Mechanism of direct dyeing, dye-fibre bond, effect of electrolytes, temperature and liquor ratio. Concept of percentage shade, application method for direct dyes on cellulose and after treatments.

Dyeing with Azoics – Introduction to Azoic colours, methods of dissolution for naphthols, concept and process of diazotization, coupling reaction.

UNIT – II

Reactive colours - Reactivity and affinity of dyes, concept of hydrolysis. Application methods for chlorotriazine dyes and influence of process parameters. Dyeing mechanism for vinylsulphones, application process, continuous application techniques and after treatments. Concept of bifunctional dyes, reactive dyes for non-cellulosic substrates.

Vat dyes - Introduction, commercial vat dyes and forms, concept of vatting and particle size. Classification of vat dyes, principles and application of vat dyes. Leuco vat, pigment padding, semi pigmentation and vat acid processes.

UNIT – III

Dyeing with Sulphur dyes - General considerations of sulphur colours, classification based on dissolution and application techniques. Reduction of sulphur dyes, oxidation process, precautions in dyeing, topping and bronziness of shades. Fastness and their improvement, stripping and sulphur black tendering.

Principles and technology of dyeing with indigosols, pigments and oxidation colours.

UNIT – IV

Dyeing of protein fibres with acid, metal- complex and mordant dyes. Classification of these dyes, their mechanisms of action and effect of process parameters.

Compatibility of dyes in mixtures.

Reading List**Title**

Technology of Dyeing
Dyeing and Chemical Technology of Textile Fibres
Cellulosic Dyeing

Author

VA Shenai
ER Trotman
John Shore

TC-305-F CHEMISTRY OF DYES

L T P
3 1 -

Classwork : 50
Examination : 100
Total : 150
Duration of exam: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

UNIT – I

Dye intermediates and its chemistry. fluorescence and phosphorescence, isomers (geometric and optical). Colour & Constitution. Classification of dyes according to chemical constitution and application. Different types of chromophores.

UNIT – II

Coupling of different naphthols, Chemistry including the synthesis of a few members of direct, acid, basic dyes. Developments of acid and basic dyes.

UNIT – III

Chemistry of azoic colours. Chemistry of vat dyes, sulphur dyes and sulphurised vat.

UNIT – IV

Disperse & reactive dyes. Developments of colourants (ink for printing. Fluorescent colour, and other industrial application). Chemistry of optical brightening agents. Chemistry of pigments.

Reading List

| Title | Author |
|---------------------------------|---------------|
| Colour Chemistry | R L M Allen |
| Chemistry of Synthetic Dyes | K Venkatraman |
| Industrial Dyes | Klaus Hunger |
| Principles of Organic Synthesis | R O C Norman |

TT-307-F TEXTILE TESTING-I (COMMON WITH TT)

L T P
3 1 -

Classwork : 50
Examination : 100
Total : 150
Duration of exam: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

TC-309-F TEXTILE DESIGN

L T P
3 1 -

Classwork : 50
Examination : 100
Total : 150
Duration of exam: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

UNIT – I

Classification of fabrics, constructional features of various woven fabrics, methods of ornamenting fabric

Construction of plain weave and their derivatives

UNIT – II

Twill and sateen weaves and their derivative

Stripe and check effects by combination of two weaves.

Vertical and horizontal hair line effect and check effect.

UNIT – III

Diamond weaves. Spot figure design on plain, twill and sateen bases. Crepe weaves, cork screw weaves, bedford cord.

UNIT – IV

WELTS and Pique structures; Mock leno; Huckaback; Honeycomb

Reading List

Title

Watson's Textile Design & Colour

Woven cloth Construction

Elementary of Textile Design

Author

Watson

Goerner

Nisbet

TT-311-F GARMENT MANUFACTURING TECHNOLOGY (COMMON WITH TT)

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| L | T | P |
| 3 | 1 | - |

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|-------------------|---|-------|
| Classwork | : | 50 |
| Examination | : | 100 |
| Total | : | 150 |
| Duration of exam: | | 3 hrs |

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

TC-313-F DYEING LAB-I

| | | |
|---|---|---|
| L | T | P |
| - | - | 3 |

| | | |
|-------------------|---|-------|
| Classwork | : | 50 |
| Examination | : | 50 |
| Total | : | 100 |
| Duration of exam: | | 4 hrs |

Introduction to experimental dyeing, commercial dye nomenclature and colour Index. Effect of salt concentration and M/L ratio on exhaustion of direct dyes. Effect of after treatments on wash fastness of direct dyes. Dyeing of cotton and rayon with various dyes - direct, azoic, reactive, sulphur, vat and indigosol. Effect of various fixation methods for reactive dyeing. Pigment dyeing. Measurement of dye exhaustion by Spectrophotometer.

Dyeing of wool and silk with acid, metal complex and mordant dyes. Measurement of light, wash and rubbing fastness of various dyeings. Stripping of dyes from fibres.

TC-315-F TECHNICAL ANALYSIS LAB

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|---|---|---|
| L | T | P |
| - | - | 3 |

| | | |
|-------------------|---|-------|
| Classwork | : | 50 |
| Examination | : | 50 |
| Total | : | 100 |
| Duration of exam: | | 4 hrs |

Identification of dyes and certain intermediates on materials and in substances according to dyeing and chemical constitution. Working of different instruments for fastness properties to light, washing, rubbing, etc. Evaluation of change in colour & staining. Measurement of viscosity of printing paste, Calorific value calculation using bomb calorimeter, effluent monitoring and testing.

TT-317-F TEXTILE TESTING PRACTICAL- I (COMMON WITH TT)

| | | |
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| L | T | P |
| - | - | 2 |

| | | |
|-------------------|---|-------|
| Classwork | : | 50 |
| Examination | : | 50 |
| Total | : | 100 |
| Duration of exam: | | 4 hrs |

TTE-319-F PATTERN CUTTING & MAKING UP (COMMON WITH TT)

| | | |
|---|---|---|
| L | T | P |
| - | - | 2 |

| | | |
|-------------------|---|-------|
| Classwork | : | 50 |
| Examination | : | 50 |
| Total | : | 100 |
| Duration of exam: | | 4 hrs |

MAHARSHI DAYANAND UNIVERSITY, ROHTAK
SCHEME OF STUDIES & EXAMINATIONS
B.Tech 3rd YEAR TEXTILE CHEMISTRY (TC)
6th SEMESTER
Proposed 'F' Scheme w.e.f 2011-12

| Course No. | Course Title | Teaching Schedule | | | | Marks of Class work | Examination | | Total Marks | Duration of Exam |
|------------|--|-------------------|---|----|-------|---------------------|-------------|-----------|-------------|------------------|
| | | L | T | P | Total | | Theory | Practical | | |
| TC-302-F | Processing of Synthetics & Blends | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| TC-304-F | Textile Printing | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| TT-306-F | Textile Testing-II (common with TT) | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| TC-308-F | Textile Finishing-I | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| TC-310-F | Garment Processing & Quality Control | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| HUM-312-F | Merchandising & Export Management (common with TT) | 3 | 1 | - | 4 | 50 | 100 | - | 150 | 3 |
| | | | | | | | | | | |
| | Practicals | | | | | | | | | |
| TC-314-F | Dyeing Lab-II | - | - | 3 | 3 | 50 | - | 50 | 100 | 4 |
| TC-316-F | Printing Lab | - | - | 3 | 3 | 50 | - | 50 | 100 | 4 |
| TT-318-F | Textile Testing Practical-II (common with TT) | - | - | 2 | 2 | 50 | - | 50 | 100 | 4 |
| TC-320-F | Industrial Wet Processing | - | - | 2 | 2 | 50 | - | 50 | 100 | 4 |
| Total | | 18 | 6 | 10 | 34 | 500 | 600 | 200 | 1300 | |

TC-302-F PROCESSING OF SYNTHETICS & BLENDS

L T P
3 1 -

Classwork : 50
Examination : 100
Total : 150
Duration of exam: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

UNIT – I

Chemistry and Technology of chemical processing of polyester, nylon and acrylics.

UNIT – II

Dyeing of important blends of natural and synthetic fibre fabrics. Analysis and remedy of barre effect. Developments of synthetic fibre dyeing and other chemical processing.

UNIT – III

Dyeing of microfibre fabrics. Dyeing machines for dyeing fibre, yarn and fabric. Mass colouration. Colouration of polypropylene. Weight reduction treatment of polyester. Machines use for batch, semicontinuous and continuous process.

UNIT – IV

Styles and techniques of printing synthetics and blended textiles. Heat setting and other finishing (Antisoiling, antimicrobial, antistatic, antipilling etc.) techniques.

Reading List

Title

Chemical processing of Synthetic
Fibres & Blends

Author

KC Datye, AA Vaidya

TC-304-F TEXTILE PRINTING

L T P
3 1 -

Classwork : 50
Examination : 100
Total : 150
Duration of exam: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

UNIT – I

Methods of printing viz block, roller, screen and transfer printing. Special effects like Batik, tie and dye etc. Design making and screen exposing. Table, flatbed and rotary screen printing.

UNIT – II

Composition of printing paste. Printing ingredients and their function. Styles of printing, i.e. direct, discharge and resist.

Printing with direct and azoic colours.

UNIT – III

Printing with, vat, solubilised vat, aniline black, reactive, acid and metal complex dyes in different styles.

UNIT – IV

Various discharging and resisting agents. Pigment printing. Transfer printing of cotton and polyester.

Methods of print fixation. Machines used in print drying, print-fixation and washing.

Reading List

Title

Technology of Printing
Textile Printing

Author

VA Shenai
LWC Miles

TT-306-F TEXTILE TESTING-II (COMMON WITH TT)

L T P
3 1 -

Classwork : 50
Examination : 100
Total : 150
Duration of exam: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

TC-308-F TEXTILE FINISHING-I

L T P
3 1 -

Classwork : 50
Examination : 100
Total : 150
Duration of exam: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

UNIT – I

Classification of finishes. Mechanical finishes – drying, stentering, damping, conditioning, calendaring, sanforizing, heat setting, crabbing, decatising, milling, potting, raising, setting and shrink finishing of wool, etc.

UNIT – II

General chemical finishes like stiffening, creping, delustering of rayon, polyester, weighting of silk and cotton, organdie finish, weight reduction of polyester etc.

UNIT – III

Classification and chemistry of softeners, their application on textiles, merits and demerits. Macro, micro and nano emulsions.

UNIT – IV

Minimum application techniques, foam finishing, vacuum systems, open width washers.

Reading List

| Title | Author |
|--|---------------|
| An Introduction to Textile Finishing | JT Marsh |
| The Technology of Textile Finishing, Vol X | VA Shenai |

TC-310-F GARMENT PROCESSING & QUALITY CONTROL

L T P
3 1 -

Classwork : 50
Examination : 100
Total : 150
Duration of exam: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

UNIT – I

Automation in Garment Industry-Information Technology in Garment Industry, Microprocessor based machinery in design, pattern making, market making, cutting, sewing, embroidery, programmable machines.

UNIT – II

Garment Processing: Dyeing of denim using Indigo Dye, Ring dyeing techniques, factors affecting dyes build-up on cellulosic material, continuous Indigo dyeing range, new Indigo vetting & dyeing techniques, finishing of denim fabric, types of denim fabrics and garment printing techniques.

UNIT – III

Garment Dyeing Machinery, Dyeing and processing of cotton garments, polyester, woolen, acrylic and blended garments, Garment wash technique, Stone-wash, Enzymatic stone wash, stain removal.

UNIT – IV

Inspection systems – raw material inspection, in process inspection, final inspection, Comparability checks.

Quality Control, Tools of Quality Control; Production planning in garment manufacturing; Cost structure in garment manufacturing; Production technology – manual and mechanical systems.

Reading List

Title

Denim- a fabric for all
(Dyeing, Weaving, finishing)
An Introduction to Quality Control for
Apparel Industry
Managing Quality for Apparel Industry

Author

Parmar MS & Others

PV Mehta

PV Mehta & SK Bhardwaj

TT-312-F MERCHANDISING & EXPORT MANAGEMENT (COMMON WITH TT)

| | | |
|---|---|---|
| L | T | P |
| 3 | 1 | - |

| | | |
|-------------------|---|-------|
| Classwork | : | 50 |
| Examination | : | 100 |
| Total | : | 150 |
| Duration of exam: | | 3 hrs |

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

TC-314-F DYEING LAB-II

| | | |
|---|---|---|
| L | T | P |
| - | - | 3 |

| | | |
|-------------------|---|-------|
| Classwork | : | 50 |
| Examination | : | 50 |
| Total | : | 100 |
| Duration of exam: | | 4 hrs |

Dyeing of polyester with disperse dye by various methods: carrier, high temperature & high pressure and thermosol dyeing. Effect of carrier concentration on dye uptake of polyester. Dyeing of Acrylic, effect of retardants. Dyeing of nylon with acid and metal complex dyes, effect of dye fixing agents. Dyeing of various blends viz. polyester/cotton, polyester/viscose, polyester/wool, cotton/wool, acrylic/wool, etc.

TC-316-F PRINTING LAB

L T P
- - 3

Classwork : 50
Examination : 50
Total : 100
Duration of exam: 4 hrs

Preparation of thickeners, Printing with direct dyes.

Cotton printing with reactive dyes - effect of dry heat, steaming and pad-batch methods of fixation, effect of various thickeners/additives; Resist and Discharge printing. Printing with azoic colours - base printing; naphtholate printing; Discharge and resist effects. Printing with vat dyes - all-in process and pad steam process. Printing with Indigosols - steaming and nitrite method. Printing with aniline black. White resist under aniline black. Pigment printing.

Polyester printing with disperse dyes, printing of nylon with acid, reactive and disperse dyes. Printing of acrylic with basic dyes.

TT-318-F TEXTILE TESTING PRACTICAL-II (COMMON WITH TT)

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| L | T | P |
| - | - | 2 |

| | | |
|-------------------|---|-------|
| Classwork | : | 50 |
| Examination | : | 50 |
| Total | : | 100 |
| Duration of exam: | | 4 hrs |

TC-320-F INDUSTRIAL WET PROCESSING

| | | |
|---|---|---|
| L | T | P |
| - | - | 2 |

| | | |
|-------------------|---|-------|
| Classwork | : | 50 |
| Examination | : | 50 |
| Total | : | 100 |
| Duration of exam: | | 4 hrs |

Orientation in Mill to get acquaintance with Singeing, desizing, scouring and bleaching, bleaching of coloured goods, Mercerization of yarn and cloth. Dyeing of loose fibre, cheese, hanks and fabrics in different machines. Single and multicolored printing.