Faculty of Engineering & Technology

P.K. University

Shivpuri (MP)

Department Of Textile Technology

Evaluation Scheme & Syllabus
for

Diploma - Textile Technology
5TH Semester

(Effective from session 2025-26)

EVALUATION SCHEME DIPLOMA –TEXTILE TECHNOLOGY

Study And Evaluation Scheme For Diploma Textile Technology

SEMESTER-5

SUBJECTCODE	SUBJECTSNAME	STUDY SCHEME Periods/Week			Credits	Marks In Evaluation Scheme						Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT			
		L	T	P		Th	Pr	Tot	Th	Pr	Tot	
DINDUTT501	Industrial Management & Entrepreneurship Dev.	4	-	-	4	30	-	30	70	-	70	100
DSPINTT502	Spinning Technology-I	3	1	-	4	30	-	30	70	-	70	100
DSPINTT503	Spinning Technology-II	3	1	-	4	30	-	30	70	-	70	100
DWEAVTT504	Weaving Technology-I	3	1	-	4	30	-	30	70	-	70	100
DWEAVTT505	Weaving Technology-II	3	1	-	4	30	-	30	70	-	70	100
DSPINTT506	Spinning Technology-I Lab	0	0	2	1	-	25	25	-	25	25	50
DSPINTT507	Spinning Technology-II Lab	0	0	2	1	-	25	25	-	25	25	50
DWEAVTT508	Weaving Technology-I Lab	0	0	2	1	-	25	25	-	25	25	50
DWEAVTT509	Weaving Technology- II Lab	0	0	2	1	-	25	25	-	25	25	50
DINDUTT510	Industrial training	-	-	-	2	-	-	-	-	50	50	50
Total		16	4	8	24	150	100	250	350	150	500	750

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4	0	0

DINDUTT501: INDUSTRIAL MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMEN

1. *Principles of Management*

1.1 Management, Different Functions: Planning, Organizing, Leading, Controlling.

1.2 Organizational Structure, Types, Functions of different departments.

1.3 Motivation: Factors, characteristics, methods of improving motivation, incentives, pay, promotion, rewards, job satisfaction, job enrichment.

1.4 Need for leadership, Functions of a leader, Factors for accomplishing effective leadership, Manager as a leader, promoting team work.

2. *Human Resource Development*

2.1 Introduction, objectives and functions of human resource development (HRD) department.

2.2 Recruitment, methods of selection, training strategies and career development.

2.3 Responsibilities of human resource management – policies and functions, selection – Mode of selection – Procedure – training of workers, Job evaluation and Merit rating.

3. *Wages and Incentives*

3.1 Definition and factors affecting wages, methods of wage payment.

3.2 Wage incentive – type of incentive, difference in wage, incentive and bonus; incentives of supervisor.

3.3 Job evaluation and merit rating.

4. *Human and Industrial Relations*

4.1 Industrial relations and disputes.

4.2 Relations with subordinates, peers and superiors.

4.3 Characteristics of group behavior and trade unionism.

4.4 Mob psychology.

4.5 Grievance, Handling of grievances.

4.6 Agitations, strikes, Lockouts, Picketing and Gherao.

4.7 Labour welfare schemes. 4.8 Workers' participation in management.

5. *Professional Ethics*

5.1 Concept of professional ethics.

5.2 Need for code of professional ethics.

5.3 Professional bodies and their role.

6. *Sales and Marketing management*

6.1 Functions and duties of sales department.

6.2 Sales forecasting, sales promotion, advertisement and after sale services.

6.3 Concept of marketing. 6.4 Problems of marketing.

6.5 Pricing policy, break even analysis.

6.6 Distribution channels and methods of marketing.

7. *Labour Legislation Act (as amended on date)*

7.1 Factory Act 1948.
7.2 Workmen's Compensation Act 1923.
7.3 Apprentices Act 1961. 7.4 PF Act, ESI Act.
7.5 Industrial Dispute Act 1947.
7.6 Employers State Insurance Act 1948.
7.7 Payment of Wages Act, 1936.
7.8 Intellectual Property Rights Act

8. *Material Management*

8.1 Inventory control models.
8.2 ABC Analysis, Safety stock, Economic ordering quantity.
8.3 Stores equipment, Stores records, purchasing procedures, Bin card, Cardex.
8.4 Material handling techniques.

9. *Financial Management*

9.1 Importance of ledger and cash book.
9.2 Profit and loss Account, Balance sheet.
9.3 Interpretation of Statements, Project financing, Project appraisal, return on investments.

10. *Entrepreneurship Development*

10.1 Concept of entrepreneur and need of entrepreneurship in the context of prevailing employment conditions.
10.2 Distinction between an entrepreneur and a manager.
10.3 Project identification and selection.
10.4 Project formulation.
10.5 Project appraisal.
10.6 Facilities and incentives to an entrepreneur.

11. *Fundamental of Economics*

11.1 Micro economics.
11.2 Macro-economics.

12. *Accidents and Safety*

12.1 Classification of accidents based on nature of injuries, event and place.
12.2 Causes and effects of accidents.
12.3 Accident-prone workers.
12.4 Action to be taken in case of accidents with machines, electric shock, fires and erection and construction accidents.
12.5 Safety consciousness and publicity.
12.6 Safety procedures.
12.7 Safety measures – Do's and Don'ts and god housing keeping.

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DSPINTT502: SPINNING TECHNOLOGY-I

1. DRAWING:

i. Objects of drawing, Construction of draw frame, its parts and their functions and passage of material through drawing frame.

ii. Drawing rollers, Top and Bottom drafting rollers and their construction.

iii. Principles of doubling and drafting.

iv. Principles deciding the gauging and setting of drafting rollers. Roller settings for Indian, American and Egyptian cottons and man-made fibres. Roller pressure and its distributions.

v. Importance of stop motions, study of electrical stop motions. Study of different drafting systems e.g. 2/2, 2/3, 3/5, 4/4 and 4/5 drafting systems.

vi. Importance and study of Auto levellors

vii. Special features of high speed draw frame, their names and different models.

viii.Defects and remedies in drafting operating.

ix. Calculations based on draft & production in draw frame.

2. COMBING -

(i) Importance and use of combing. Cottons commonly used for combing and the yarns for which cotton is generally combed.

(ii) Sliver lapper - Its object, construction and methods of feeding slivers to the sliver lapper.

(iii) Draft and production, lap winding and roll setting of sliver lapper.

(iv) Ribon lapper - Its importance and construction, draft and production of ribbon lapper. Stop motion of ribbon lapper.

(v) Construction and working of super laper and lap former machine..

(vi) Drawing lap formation combination its advantages. Study of autommatic lap former.

(vii) Modern methods of lap preparation, Its historical development, Comber noil and degree of combing, subdivision of combing and brief combing cycle, detailed study of Nasmith comber, Modern trends in combing and control of comber waste, study of modern comber and study of various parts and their functions, settings, speeds and mechanism.

(viii) Calculation Noil% regarding production of comber.

3. ROVING :

(i) Objects of roving study and construction and functions of various parts of speed frame/simplex and passage of material through them.

(ii) Drafting mechanism, drive of drafting rollers, pressure on drafting rollers.

(iii) Basic principles of Cone drum.

(iv) Twisting and method of twisting, study of motions required for twisting flyer and its functions.

(v) Winding : Principle of winding, bobbin leading and flyer leading winding, drive of winding mechanism. Traverse motion given to hobbins, building motion and its functions.

(vi) Differential motion, its objects and working principles, study of differential motion.

(vii) Calculation pertaining to production, twist, draft and winding.

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L	T	P
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DSPINTT503: SPINNING TECHNOLOGY-II

1. RING SPINNING:
(i) Objects of ring frames, construction and functions of various parts of ring frames Viz Rings, Spindles, Balloon Control Rings, Spacer, Approns, Cots, Spindle tape, Rising and Falling Lappets.
(ii) Traveller, Function of Traveller, Traveller type, size and No.
(iii) Passage of material through ring frames.
(iv) Twisting of Yarn, Effect of Twist, Twist terminology, Concept of twist multiplier, Factors affecting twist in spinning.
(v) Principles of Roller drafting and Drafting systems e.g. Casablanca appron drafting system, W.S.T., S.K.F.,m and their advantages, break draft and its effect.
(vi) Building motion, its objects construction and working,
Types of builds (i) Warp (ii) Filling (iii) Combination
(iv) Revrse.
(vii) Drive of ring frame, Different systems of Ring Frame drive like Group drive, Single Motor Drive, VPS (Variable Pitch Seath) and Dual Drive.
(viii) Causes of end breaks in ring frame.
(ix) Limitation of Large Package Spinning.
(x) System of waste collection at ring frames and different types of spinning wastes.
(xi) Factor's responsible for less efficiency in spinning.
(xii) Limitations of ring spinning
(xiii) Yarn faults and their remedies.
(xiv) Recent developments in Ring Spinning.

RING FRAME CALCULATION:
(i) Calcualtion of Draft twist, Production and efficiency for different counts and diameter of Yarns.
(ii) Calculation of balancing machines used in spinning processes for various counts-Spin Plan.
(iii)Concept of average mill count and 20's conversion.
(iv) Traveller speed, traveller lag calculation.

2. DOUBLING:-
(i) Object of ring doubling, doubling and its effects, dry and wet system of doubling. Detailed study of Ring Doubler and Two for One Twister - Basic principles, Machine geometry, Different types of T.F.O. twister. Production and efficiency calculation and Advantages over one for one twister.
(ii) Fancy doubling Yarns, their objects and their production Viz. Ply Yarn, Tape Yarn, Core Yarn and Sewing Threads.
(iii) Production of folded yarn, cord and tape yarn production.
(iv) Calculation of folded yarns.

3. REELING BUNDLING:
Object and terminology, Types of Reels, Construction and working of Reels, Different system of Reeling. Yarn bundling and balings.

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DWEAVTT504: WEAVING TECHNOLOGY – I

1. HANDLOOM WEAVING : Its main features, Its uses. Difference in quality of product woven by Handloom and that by Powerloom. Special features of handloom woven fabrics.Description and working of Handloom machines showing all necessary parts and their working.

2. PLAIN LOOM

(i) History of weaving.

(ii) Terminology.

(iii) Power loom - primary, Secondary and auxiliary motions of plain tappet loom.

3. A. SHEDDING :

1. Different types of healds, reeds and shuttles.

2. Different types of sheds, their merits and demerits.

3. Tappet shedding mecahnism and warp easing mechanism.

4. Introduction to various types of tappets.

5. Designing of negative shedding tappets.

6. Merits and demerits of tappet shedding.

7. Heald reversing motions.

8. Timimg of shedding motions. Early and late shedding.

9. Commonly occuring faults in shedding mechanism their remedies.

10. Calculations pertaining of healds and reed.

B. PICKING AND BEATING UP

(i) Introduction to various parts of motions and their setting/adjustments.

(ii) Mechanism of over pick and under pick motions their merits and demerits - Methods of varying the intensity of picking in each case. Valocity of shuttle.

(iii)Causes and remedies of shuttle flying and traping.

(iv) Remedies of earely and late picking.

(v) Beating up motion : Mechanism of beating motion. Eccentricity of sley.

C. TAKE-UP MOTIONS AND LET OFF MOTIONS

(i) Various types of take up motions.

(ii) Study of five and seven wheel intermittent positive take up motion and calculations.

(iii)Continuous positive take up motion.

(iv) Negative take up motion.

(v) Let off motions:

1. Various types of let off motions.

2. Study of negative let off motions.

3. Study of semi-positive & positive let off motion

4. WEFT STOP MOTIONS

(i) Various types of weft stop motions.

(ii) Study of side weft fork motions.

(iii) Study of centre weft fork motions.

(iv) Break motion, Anticrack motion.

5. WARP PROTECTORS

A. (i) Study of loose reed motion.

(ii) Study of fast reed motion.

B. OTHERS (i) Temples.- Types of Temples

(ii) Shuttles guards.

6. CALCULATION (i) Calculation pretaining to costing of : yarns, resultant count, average count, moisture content, tape length.

(ii) Calculation of wt- of warp, weight of weft, wt/sq. yard etc.

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DWEAVTT505: WEAVING TECHNOLOGY – II

1. DOBBIES :

(i) Classification of dobbies.

(ii) Study of single lift bottom closed shed centre closed shed, semi open shed, open shed dobbies with special reference to Keighley and Climax dobbies.

(iii) Positive dobbies (any two dobbies).

(iv) Timing and setting of dobbies.

(v) Method of preparing dobby lattice and Pattern cards

(vi) Synchronising of dobby with drop box.

(vii) Cross border dobby.

(viii) R. H. and L. H. dobby, dobby mounting, dwell of dobby.

(ix) Commonly occuring faults in mechanism and their remedies.

(x) Calculation relating to production, efficiency yarn requirements, waste etc for looms.

2. MULTIPLE BOX MOTIONS

(i) Introduction to multiple box motions.

(ii) Kinds of multiple box motions.

(iii) Study of Cowburn and Peck's box motion its card saving device, safey devices.

(iv) Study of Knowle's box motion.

(v) Study of pick at will box arrangement.

(vi) Study of non skip and skip motions.

(vii) Preparation of chain for given pattern of weft.

(viii) Commonly occuring faults in boxes of the above mechanisms and their remedies.

3. JACQUARD:

(i) Introduction to figure weaving.

(ii) Kinds of jacquard.

(iii) Double lift single cylinder jacquard.

(iv) Double lift double cylinder jacquard.

(v) Cross border jacquard.

(vi) Single lift single cylinder jacquard

(vii) Twilling jacquard.

(viii) Gauge and Leno jacquard.

(ix) Fine pitch Jacquard.

(x) Pressure harness.

(xi) Sectional harness.

(xii) Harness building.

(xiii) Harness ties.

(xiv) Card cutting, Piano card cutting machine and lacing of cards

(xv) Repairing, adjustments and timing of the above machines.

(xvi)Commonly occuring faults in jacquard weaving and their remedies.

4. AUTOMATIC WEAVING:

(i) Feeler, cutter and three pick try motion.

(ii) Warp stop motion.

(iii) Pirn changing mechanism.

(iv) Shuttle protector.

(v) Shuttle changing mechanism.

(vi) Centre selvedge motion.

5. GENERAL:

1. Difference between cotton weaving and synthetic blends weaving.

2. Cloth defects, their causes and remedies.

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DSPINTT506:SPINNING TECHNOLOGY-I LAB

List of Experiments

1. Calcualte the draft constant, twist constant, spindle speed, front roller speed and production per spindle from machine particulars in the workshop.
2. To prepare sliver laps on the sliver lap machines and to Mgauge the rollers.
3. To calculate all tensions drafts, Intermediate drafts, Total draft, Draft constant and Production of sliver lap machine.
4. Operate the ribbon lap machine and prepare laps and gauge the rollers of the machine.
5. To calculate all tensions drafts, Intermediate drafts, total drafts, Draft constant and Production of ribbon lap machine.
6. To operate and set timing of comber and prepare sliver.
7. Set and gauge various parts of comber.
8. To calculate and analyse the comber waste percentage practically and evaluate the combing efficiency.
9. To calculate all tension drafts, Intermideate drafts, Total drafts and Drafts constant and production of comber machine.
10. Operate the fly frame with material and practice the piecing of roving.
11. Set building motion and traverse motion according to hank of roving.
12. Calculate spindle speed, front roller speed and rate of traverse from machine particulars.
13. To Gauge the drafting rollers and to practice changing of draft change pinion (DCP), lifter change, change wheel, twist wheel, ratchet wheel and winding wheel.
14. Level the bobbin rail and adjust the lift of fly frame.
15. Set the spindle and bolster and footstep bearing and clean and lubricate the machine (Flyframe).
16. To calculate production per shift of eight hours and time required to fill one can of 3000 meters sliver capacity on card machines
17. Operate the drawing machine and to practice piecing of sliver.
18. Setting and gauging of drafting rollers for given staple length of fibres.
19. To lubricate and put the stop motion in proper working order of draw frame.
20. To calculate the speed of different moving parts of a draw frame machine
21. To calculate the production on draw frame per delivery per machine per shift of eight hours

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DSPINTT507: SPINNING TECHNOLOGY-II LAB

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List of Experiments-

1. To make cheeses on parallel winding machine and calculate drum speed and production.
2. Operate the doubling machine and produce folded yarn and to calculate twists constant, TPI, Spindle speed and production.
3. Make hanks of yarn on reeling machine by straight reeling method and cross reeling method
4. Make bundles of yarn on the bundling machine.
5. To Calculation twist constant and draft constant and production from machine particulars of ring frame.
6. Operate the machine and produce yarn.
7. Gauge the Spindle and Lappets.
8. To learn the changing the draft change pinon and twist wheel, traveller and ratchet wheel at ring frames and mount the spindle tape and set it for 'S' and 'Z' twist.
9. Set the building motion according to the count of yarn.
10. Set the top arm and gauge the top and bottom rollers.
11. Carryout the maintenance of ring frame practically.
12. To calculate spindle speed , Twist Constt, TPI & Production of ring doubler.
13. To learn about making spin plan, taking breaking study, snap study of idle spindles, labour allocation in Ring frame dept on assumption basis.
14. To study traveller speed & doff weight of Ring frame.
15. To calculate count cint. & strength cint. in Ring yarn on assumption basis.

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0	0	2

DWEAVTT508: WEAVING TECHNOLOGY I LAB

LIST OF EXPERIMENTS

1. Practice of beam gaiting.
2. Practice of fixing and tuning the whole loom to run for perfect weaving.
3. Dismantling of various parts of dobby, their sketching and resetting.
4. Timing and adjustment of dobby for giving connection of T lever, Arm and Eccentric provided on the shaft. Barrel setting.
5. Practice of preparing dobby lattice.
6. Practice of operating loom fitted with dobby and weaving of cloth.
7. Practice of mending broken ends after leveling the healds.
8. Finding and removing faults in dobby weaving.
9. Fixing and tuning of drop box motion.
10. Chain preparation for different weft plans.
11. Sketching of various parts of drop box motion

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L	T	P
0	0	2

DWEAVTT509: WEAVING TECHNOLOGY II LAB

LIST OF EXPERIMENTS

1. Harness preparation of jacquard.
2. Sketching of cylinder movement of various types of jacquard.
3. Sketching of knife movement of various types of jacquard.
4. Development of jacquard pattern and their execution after card cutting and card lacing.
5. Practice of preparing sectional harness.
6. Practice of running automatic loom.
7. Settings for feeler, battery, warp stop motion, let off motion and their sketches.
8. Practice in card cutting, lacing of cards for Jacquard designs.
9. Practice of running air jet loom.
10. Practice of running circular shuttle less weaving machines.
11. Practice of operating handlooms

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DINDUTT510: INDUSTRIAL TRAINING

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It is needless to emphasize further the importance of Industrial Training of students during their 3 years of studies at Polytechnics. It is industrial training, which provides an opportunity to students to experience the environment and culture of industrial production units and commercial activities undertaken in field organizations. It prepares student for their future role as diploma engineers in the world of work and enables them to integrate theory with practice. Polytechnics have been arranging industrial training of students of various durations to meet the above objectives.

This document includes guided and supervised industrial training of 4 weeks duration to be organized during the semester break starting after second year i.e. after 4th semester examinations. The concerned HODs along with other teachers will guide and help students in arranging appropriate training places relevant to their specific branch. It is suggested that a training schedule may be drawn for each student before starting of the training in consultation with the training providers. Students should also be briefed in advance about the organizational setup, product range, manufacturing process, important machines and materials used in the training organization.

Equally important with the guidance is supervision of students training in the industry/organization by the teachers. Students should be encouraged to write daily report in their diary to enable them to write final report and its presentation later on.

An external assessment of 50 marks has been provided in the study and evaluation scheme of 5th Semester. Evaluation of professional industrial training report through viva-voce/presentation aims at assessing students understanding of materials, industrial process, practices in industry/field organization and their ability to engage in activities related to problem solving in industrial setup as well as understanding of application of knowledge and skills learnt in real life situations.

Teachers and students are requested to see the footnote below the study and evaluation scheme of 4th semester for further details.

The teacher along with field supervisors will conduct performance assessment of students. The components of evaluation will include the following:

Punctuality and regularity 15%
Initiative in learning new things 15%
Presentation and VIVA 15%
Industrial training report 55%