Fabric Engineering
Level-3, Term-1

Sl. No.	Subject Code	Name of subject	Contact Hour/ Week	Credit	Mark Distribution*		
					C	F	Total
1	HSS 301	Economics	3	3	28	72	100
2	YE 307	Yarn Manufacturing-II	3	3	28	72	100
3	YE 308	Yarn Manufacturing-II (Practical)	2	1	80	20	100
4	FE 307	Knintting-I	3	3	28	72	100
5	FE 308	Knintting-I (Practical)	2	1	80	20	100
6	WPE 311	Wet Processing-II	3	3	28	72	100
7	WPE 312	Wet Processing-II (Practical)	2	1	80	20	100
8	AE 309	Apparel Manufacturing-II	3	3	28	72	100
9	AE 310	Apparel Manufacturing-II (Practical)	2	1	80	20	100
10	TEM 313	Industrial Management	3	3	28	72	100
Total			**26**	**22**	**488**	**512**	**1000**

HSS 301 : Economics

Credit	Hour / Week	Total Hour
3	3	45

Introduction to economics and engineering. Different economic system, Fundamental economic problems. Basic elements of demand, supply and product market. Theory of utility and preferences, consumer's surplus. Theory of production and cost. Theory of the firm and market structure. Optimization. Introducing macroeconomics. National income accounting, the simple Keynesian analysis of

national income, employment and inflation. Saving, investment and decision making. Fiscal policy and monetary policy-money and interest rate, income and spending. Economics of development and planning.

YE 307: Yarn Manufacturing- II

Credit	Hour / Week	Total Hour
3	3	45

Long Staple Spinning: Flow-chart of jute spinning, object, material passage, working procedure, different parts and production of jute softener, spreader, breaker card, finisher card, 1st , 2nd , 3rd of jute drawing, different jute spinning machine. Different types of jute yarn and its uses.

Modern Spinning: Modern spinning systems. Brief out line, production, limitation and advantages of rotor, air-jet, air-vortex, friction and wrap spinning. Yarn property and end uses of rotor, air-jet, air-vortex, friction and wrap yarn. Modern long-staple spinning systems.

Spinning of Man-made fibres & their blends: Detailed study of processing man-made staple fibres, viz, viscose rayon, polyester, acrylic and their blends with cotton on cotton processing machines, changes in machine speeds, settings and productions, properties of blended yarns.

Special Yarn: Production, character and end-uses of special yarn(core-spun, slub, siro, compact, chenille, textures, fancy and different composite yarn). Special Jute yarn.

YE 308: Yarn Manufacturing- II (Practical)

Credit	Hour / Week	Total Hour
1	2	30

Practical study of jute spinning machinery.

Material passage diagram gearing, setting and draft, twist & Production calculation.

Practical study of Rotor and Airjet Spinning machine. Material passage diagram and Production calculation.

FE 307: Knitting - I

Credit	Hour / Week	Total Hour
3	3	45

Introduction to knitting: Historical background of knitting Technology. General terms related to knitting. Characteristics of knitting yarn, mechanical principles of knitting technology, Elements of knitting, knitting action on latch, bearded and compound needles.

Weft knitting:

Basic weft knitted structures: Characteristics, Notations, Identification and uses.

Basic loop or stitch type: Definition, Features and Knitting action of Tuck, Held and Float stitches.

Weft knitting machines: Features, Classification and products of weft knitting machines. Fabric machines used for cut & sewn knitwear and garment length machines used for fully fashioned knitwear.

Single jersey circular knitting machines: Features, Main parts, Knitting action, Cam system and sinker timing.

Rib and Interlock circular knitting machine: Features, Main parts, Needle gaiting, Knitting action, Cam system and needle timing.

Purl knitting machine: Features, Knitting action and cam system.

Flat knitting machine: Features, Classification, Main parts, Knitting action and cam system.

Calculation related to weft knitting.

Warp Knitting: Introduction to warp knitting: Basic elements of warp knitting i.e. needle, sinker and guide, lapping movements of guides, pattern mechanism, warp beam, chain link, basic overlap and underlap variations, basic structures of warp knitting.

Warp knitting machinery: Classes of warp knitting machinery.

Tricot warp knitting machines: Features, knitting elements and knitting action on bearded and compound needle.

Raschel warp knitting machines: Features, knitting elements and knitting action on latch and compound needle.

Two fully threaded guide bar structures: Features, lapping diagram, chain notation and end uses.

Calculation related to warp knitting.

FE 308: Knitting - I (Practical)

Credit	Hour / Week	Total Hour
1	2	30

Layout of machinery involved, loop forming techniques of different circular, flat and warp knitting machines. Practical study on feeding, take down, driving and operational technique of knitting machinery, stop motion etc. detection of fabric specification from given samples.

WPE 311: Wet Processing-II

Credit	Hour / Week	Total Hour
3	3	45

Printing: Flow chart of printing process; Printing ingredients and their properties and functions; Thickeners & their types and properties (Natural, Synthetic Polymers, Emulsion thickeners, etc.); Preparation of Print paste.

Methods and styles of Printing: Printing processes for printing in different styles.

Printing processes for fabrics of different fibres with Direct, Acid, Basic, Vat, Reactive & Disperse dyes and their after-treatments; Printing with pigment; Study of steaming, curing and washing processes; Methods of screen and roller preparation. Detail study on screen printing.

Special printing methods (Transfer Printing, Jet printing, Flock printing, Burn-out printing).

Faults in printing and their remedies.

Finishing: Definition and classification of finishing;

Physical and Mechanical finishing: Different types of calendaring, raising, shearing, sanforizing, hydro-extraction, dewatering, slitting, compacting, stentering, etc.

Chemical finishing: Mercerization and parchmentisation, resin finish, water repellency, flame retardancy. Softening, etc.

Special finishing: rot-proofing, mildew proofing, insect and bacterial finishes, soil release, anti-static finishes etc.

WPE 312: Wet Processing-II (Practical)

Credit	Hour / Week	Total Hour
1	2	30

Printing: Preparation of printing paste; Printing on different textile materials (Cotton, Jute, Wool, Silk, nylon, polyester etc.) with direct, Acid, Basic, Vat, Reactive, Disperse dyes & Pigments with block, transfer, screen printing.

Finishing: Mercerization of cotton fabric; Estimation of mercerization effect; Crease resistant finish on cotton fabric; performance of crease resistant finish; Water repellent; flame retardant and parchmentization finish, etc. on cotton fabric. Application of optical brightening agent and softeners.

AE 309: Apparel Manufacturing-II

Credit	Hour / Week	Total Hour
3	3	45

Production system in apparel industry.

Inventory Control; Material Management; Material handling systems.

Cutting room, Sewing room and finishing room management: layout planning, Line balancing;

Apparel Washing: Concept of washing, requirements; washing equipment; dyeing and drying machines; chemicals used in apparel washing and dyeing.

Types of Apparel washing:

Wet Process: Normal wash, Caustic wash, Bleach wash, Pigment wash, Enzyme wash, Stone wash, Acid wash, Stone-Enzyme wash, Super white wash.

Dry Process: Sand Blasting, Whiskering, Hand scrapping, Whiskering, wrinkles, Tagging, Grinding & Destroy, PP spray and PP sponging.

Apparel Dyeing: Definition, objectives, advantages and disadvantages of apparel dyeing; garment dyeing machinery; basic theory of apparel dyeing; garments dyeing with reactive dye, direct dyes, pigments, sulpher dye; problems associated with garments dyeing.

Apparel Tinting: Apparel tinting by reactive dye, direct dye and other dye.

Special Apparel Production: Definition, purpose, materials and functions of special apparel etc.

Protective clothing: Definition and types, Fire proof clothing, Heat and flame retardant apparel, Naval and Armed forces clothing, Bullet proof vest, Water proof breathable fabric, Thermal clothings, Antimicrobial protection, Rain coats, Racing driver's apparels, Jogging suits, chemical hazards protective clothes; Smart textiles and apparels, Sportswear, Electronic textiles,

Latest development and research works.

AE 310: Apparel Manufacturing-II (Practical)

Credit	Hour / Week	Total Hour
1	2	30

- General machine maintenance, thread path, main adjustment

points and sample making with industrial sewing machine.

- Practical study on fusing m/c.
- Practical study on various types of Apparel washing. (Normal wash and Enzyme wash, Bleach wash, Acid wash etc.).
- Practical study on various dry wash process for apparel products.
- Practical study on apparel dyeing with reactive and direct dye.
- Practical study on computerized embroidery m/c.
- Study on CAD /CAM for apparel production.
- Practical study on line balancing (Layout plan, operation breakdown and SMV determination of apparel products).

TEM 313 : Industrial Management

Credit	Hour / Week	Total Hour
3	3	45

Management & Organization: Definition, Function and role of management, Nature and scope of business, Direction and Communication-budgetary control, Organization structure, Type of structure, Work measurement and Wage plan operational research, Span of Supervision, Motivation, Leadership, Nature of Behavior, Personality, Psychology of labor/ management reactions from different types of companies.

Personnel Management: Concepts, Policy, Structure and Functions of personnel department, Line and staff organization, Recruitment, Training, Job evaluation. Methods of remuneration, Organization of employers and work people, ILO, Trade union organization, Collective Bargaining, Labor Welfare, Disputes, Job specifications, Job descriptions, Disciplinary actions, show cause, charge sheet etc. Health, safety and working conditions.

Production Economics: Basic concepts in economics- utility of goods, wealth, value, price and want, Theory of utility of supply and

demand, Elasticity of supply and demand. Problems of allocation and study capital.Production- factors of production -division of labor, location of industries, specialization. The economics of scale small and large scale production. Production curves and production function.

Investment decisions: Feasibility studies to set up a new Mill-Economic, Market, Financial and Technical feasibility studies. Economic evaluation and comparison of alternative investments-Capital budgeting technique.Project Management through CPM/PERT.

Marketing Basics: Concept of Market and Marketing; Marketing Process; Marketing Mix; Marketing Environment-Inland & Foreign; Buyers' Behavior; Market Segmentation, Targeting, Positioning; Product & its Life Cycle management, Branding; Pricing; Distribution Channel, Promotion.

Legal issues for Industrial Management: Contract Act, 1872-definition of contract, agreement, promise, essential of a valid contract, offer, acceptance, consideration and other relevant issues. Industrial policy 2010(prevailing one)-definition & classification of industries, thrust sector, investment incentives, diversification of industries, etc. Bangladesh Labor Law 2006-conditions of service & employment, health & hygiene, welfare & safety, working hours & leave, trade union & industrial relations, etc.