BANGLADESH TECHNICAL EDUCATION BOARD

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM

GARMENTS DESIGN AND PATTERN MAKING TECHNOLOGY

SYLLABUS

FIFTH AND SIXTH SEMESTER

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM
GARMENTS DESIGN AND PATTERN MAKING TECHNOLOGY
COURSE STRUCTURE

FIFTH SEMESTER

Sl. No	Subject Code	Subject Name	T	P	C
1.	4951	Garments Manufacturing – II	2	3	3
2.	4952	Printing and Finishing Process	2	3	3
3.	4953	Garments Production Planning and Control	2	0	2
4.	4954	Garments Pattern Making – II	0	3	1
5.	2621	Spreadsheet Analysis	0	3	1
6.	2622	Programming in C	2	3	3
7.	1451	Applied Mathematics – II	2	3	3
8.	1355	Environmental Management	2	0	2
9.	1551	Book Keeping and Accounting	2	0	2
10.	1552	Business Organization	2	0	2
			16	**18**	**22**

SIXTH SEMESTER

Sl. No	Subject Code	Subject Name	T	P	C
1.	4961	Garments Manufacturing –III	2	3	3
2.	4962	Maintenance of Garments Manufacturing Machine	1	3	2
3.	4963	Textile Testing and Quality Control – II	2	3	3
4.	4964	Garments Human Resource Management	2	0	2
5.	4965	Garments CAD and CAM	1	6	3
6.	4966	Garments Import and Export Management	2	0	2
7.	4967	Garments Finishing and Quality Control	2	3	3
8.	1561	Business Communication	2	0	2
9.	1562	Industrial Management – I	2	0	2
			16	**18**	**22**

CONTENTS

FIFTH SEMESTER

SIXTH SEMESTER

NUMBER DISTRIBUTION

FIFTH SEMESTER

Sl. No	Subject code	Name of the subject	T	P	C	MARKS				
						Theory		Practical		Total
						Cont. assess.	Final exam.	Cont. assess.	Final exam.	
1.	4951	Garments Manufacturing – II	2	3	3	50	50	30	20	150
2.	4952	Printing and Finishing Process	2	3	3	50	50	30	20	150
3.	4953	Garments Production Planning and Control	2	0	2	50	50	-	-	100
4.	4954	Garments Pattern Making – II	0	3	1	-	-	30	20	50
5.	2621	Spreadsheet Analysis	0	3	1	-	-	30	20	50
6.	2622	Programming in C	2	3	3	50	50	30	20	150
7	1451	Applied Mathematics – II	2	3	3	50	50	50	-	150
8	1355	Environmental Management	2	0	2	50	50	-	-	100
9	1551	Book Keeping and Accounting	2	0	2	50	50	-	-	100
10	1552	Business Organization	2	0	2	50	50	-	-	100
			16	**18**	**22**	**400**	**400**	**200**	**100**	**1100**

NUMBER DISTRIBUTION

SIXTH SEMESTER

Sl. No	Subject code	Name of the subject	T	P	C	MARKS				
						Theory		Practical		Total
						Cont. assess.	Final exam.	Cont. assess.	Final exam.	
1.	4961	Garments Manufacturing –III	2	3	3	50	50	30	20	150
2.	4962	Maintenance of Garments Manufacturing Machine	1	3	2	25	25	30	20	100
3.	4963	Textile Testing and Quality Control – II	2	3	3	50	50	30	20	150
4.	4964	Garments Human Resource Management	2	0	2	50	50	-	-	100
5.	4965	Garments CAD and CAM	1	6	3	25	25	60	40	150
6.	4966	Garments Import and Export Management	2	0	2	50	50	-	-	100
7	4967	Garments Finishing and Quality Control	2	3	3	50	50	30	20	150
8	1561	Business Communication	2	0	2	50	50	-	-	100
9	1562	Industrial Management – I	2	0	2	50	50	-	-	100
			16	**18**	**22**	**400**	**400**	**180**	**120**	**1100**

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM

GARMENTS DESIGN AND PATTERN MAKING TECHNOLOGY

SYLLABUS

FIFTH SEMESTER

4951	GARMENTS MANUFACTURING – II	T	P	C
		2	3	3

AIMS

To be able to develop knowledge, skill and attitude in the field of garments manufacturing with special emphasis on:

- fabric spreading and fabric spreading machine
- fabric cutting and fabric cutting machine
- fabric splice stitches and seam.

SHORT DESCRIPTION

Fabric spreading; Fabric spreading machines; Fabric splice; Fabric cutting; Fabric cutting machine; Stitches and seam.

DETAIL DESCRIPTION

Theory:

1 Understand the fabric spreading.
- 1.1 Define fabric spreading.
- 1.2 Mention the requirements of fabric spreading.
- 1.3 Describe the methods of fabric spreading.
- 1.4 List the types of fabric lays.
- 1.5 Describe each type of fabric lays.
- 1.6 List the types of fabric packages.
- 1.7 Describe each type of fabric package.

2 Understand the fabric spreading machines.
- 2.1 Mention the classification of fabric spreading machine.
- 2.2 Describe the manual method of fabric spreading.
- 2.3 Describe the feature of semi-automatic fabric spreading machine.
- 2.4 Describe the feature of fully automatic fabric spreading machine.

3 Understand the fabric splice.
- 3.1 Define splice.
- 3.2 List the types of splice.
- 3.3 Describe different types of splice.

4 Understand the fabric cutting.
- 4.1 Define fabric cutting.
- 4.2 Mention the requirements of fabric cutting.
- 4.3 Describe the methods of fabric cutting.

5 Understand the fabric cutting machines.
- 5.1 Mention the names of manual cutting machine.
- 5.2 Mention the names of computerized cutting machine.
- 5.3 Describe the round knife & straight knife cutting machine.

5.4 Describe advantages and disadvantages of bent knife cutting machine.
5.5 Describe the features of Die cutting & drill machine.
5.6 Describe computerized fabric cutting (CAM) machine.
5.7 Describe water jet cutting machine.
5.8 Describe laser cutting machine.
5.9 Describe plasma torch cutting machine.

6 Understand the sewing threads.

6.1 Define sewing threads.
6.2 List different types of sewing threads.
6.3 Describe the process of cotton sewing thread.
6.4 Describe the process of TC sewing thread.
6.5 Describe the process of polyester sewing thread.

7 Understand the stitches.

7.1 Define stitches.
7.2 Mention the classification of stitches.
7.3 Describe the principle of lock stitch formation.
7.4 Define chain stitch.
7.5 Describe the principle of chain stitch formation.
7.6 Describe the advantages and disadvantages of lock stitch formation.
7.7 Describe the advantages and disadvantages of chain stitch formation.
7.8 Describe the principle of multi-thread chain stitch formation.

8 Understand the seam.

8.1 Define seam.
8.2 Describe the properties of seam.
8.3 Mention the classification of the seam.
8.4 Describe different types of seam.

9 Understand the sewing machine.

9.1 Define sewing machine.
9.2 List different types of sewing machine.
9.3 Describe each types of sewing machine.
9.4 List different components of general sewing machine.
9.5 Describe the function of different components of general sewing machine.

Practical:

1 Practice on different types of fabric lay making.
2 Draw the diagrams of fabric cutting machines and level important parts.
3 Practice on cutting out garments components from the fabrics with the help of different fabric cutting machines.
4 Produce stitches on fabric with varying stitch density in straight line, curve, line, circle line & rectangle line.
5 Produce chain stitch, lockstitch & overlock stitch on single layer & multilayer fabric.
6 Produce different types of seams with lock stitch & chain stitch.

4952	PRINTING & FINISHING PROCESS	T	P	C
		2	3	3

AIMS

To be able to develop knowledge, skill and attitude in the field of printing and finishing process with special emphasis on:

- printing, printing paste and ingredients
- printing thickness and printing machinery
- method and style of printing
- ageing and steaming
- printing and finishing
- sunfotising and calendering.

SHORT DESCRIPTION

Printing; Printing paste and ingredients; Printing thickness; Methods and styles of printing; Printing machinery; Ageing and steaming; Printing of cellulose fabric; Printing of wool and silk fabrics; Printing with disperse dye; Printing with pigments; Textile finishing; Sunforising; Calendering and Anti creasing.

DETAIL DESCRIPTION
Theory:

1 Understand the printing.
- 1.1 Define printing.
- 1.2 Describe the flow chart of printing process.
- 1.3 Describe the necessity of printing.
- 1.4 Distinguish between dyeing & printing.

2 Understand the printing paste & ingredients.
- 2.1 Describe the essential ingredients of printing paste.
- 2.2 Describe the functions of the wetting agents.
- 2.3 Mention the function of dispersing agents.
- 2.4 Mention the functions of defoaming agents.
- 2.5 Mention the functions of oxidizing and reducing agents.
- 2.6 Mention the function of catalyst.

3 Understand the printing thickeners.
- 3.1 Define printing thickeners.
- 3.2 Mention the objects of thickeners.
- 3.3 Mention the properties of printing thickeners.
- 3.4 Describe natural thickeners agents.
- 3.5 Describe the modified natural thickeners.
- 3.6 Describe the synthetic thickening agents.

3.7 Mention the properties of starch.
3.8 Mention the preparation process of starch.

4 Understand the methods and styles of printing.

4.1 Describe different methods of printing.
4.2 Describe different styles of printing.
4.3 Describe block printing process.
4.4 Describe ribe batik printing process.
4.5 Describe ribe tie dye printing process.

5 Understand the printing machinery.

5.1 Describe screen preparation of process.
5.2 Describe screen and rotary screen printing machine.
5.3 Describe roller printing machine.
5.4 Mention advantages and disadvantages of roller printing.
5.5 Mention advantages and disadvantages of screen printing.
5.6 List the limitation of printing machine.

6 Understand the ageing and steaming.

6.1 Mention the functions of ageing & steaming for printing.
6.2 Describe rapid ageing process.
6.3 Describe high pressure steaming process.
6.4 Describe high temperature loop steamers.

7 Understand the printing of cellulosic fabrics.

7.1 Describe the printing process of cotton fabric with direct dyes.
7.2 Describe the printing process of cotton fabric with reactive dyes.
7.3 Describe the sequences of dye cotton fabric dyeing with basic dye.
7.4 Describe sequence of dyeing cotton fabric with vat dyes.

8 Understand the printing of wool & silk fabrics.

8.1 Describe the printing paste preparation for printing wool and silk fabrics.
8.2 Describe the printing process of wool and silk with acid and reactive dyes.
8.3 Describe steaming process of wool and silk fabric.

9 Understand the printing of synthetic fabric with disperse dye.

9.1 Describe the printing paste preparation of disperse dye.
9.2 Describe the printing process of polyester & nylon with disperse dyes.
9.3 Describe the printing process of blend (TC) fabric with disperse dyes.
9.4 Describe the steaming process of disperse printing.

10 Understand the printing with pigments.

10.1 Describe pigments color.
10.2 Describe binder preparation for pigment printing.
10.3 Describe the printing procedure of cotton & polyester fabrics with a pigment.
10.4 Describe the curing system of pigment printing.
10.5 Identify the faults of pigment printing.
10.6 Describe the remedies of the faults of pigment printing.

11 Understand the textile finishing.

11.1 Define textile finishing.
11.2 Mention the classification of textile finishing.
11.3 Mention the importance of textile finishing.
11.4 Describe the physical finishing of cotton.
11.5 Describe the mechanical finishing of cotton.
11.6 Describe synthetic fabric finishing.
11.7 Describe blended fabric finishing.

12 Understand the sunforising.

12.1 Mention the objects of sunforising.
12.2 Describe the sunforising sequence of textile finishing process.
12.3 Describe sunforising machine.

13 Understand the calendering.

13.1 Define calendering.
13.2 Mention the objects of calendering.
13.3 List the essential elements of calendering.
13.4 Classify the calendering.
13.5 Describe 5-bowl, 7-bowl and soft calendering processes.

14 Understand the anti-creasing.

14.1 Define anti-creasing.
14.2 Mention the functions of anti-creasing.
14.3 Describe the importance of anti-creasing.
14.4 Describe anti-creasing process.
14.5 Mention the advantages of anti-creasing.

Practical:

1. Prepare printing paste by using different printing agent.
2. Print cotton fabric with direct dye.
3. Print cotton fabric with reactive dye.
4. Print cotton fabric with azoic dye.
5. Print jute fabric with direct dye.
6. Print jute fabric with basic dye.
7. Print synthetic fabric with disperse dye.
8. Print TC fabric with pigment dye.
9. Print wool fabric with acid dyes.
10. Print silk fabric with acid dyes.
11. Calendar the cotton fabric.

4953 GARMENTS PRODUCTION PLANNING AND CONTROL

T	P	C
2	0	2

AIMS

- To be able to understand the planning of garments production and control.
- To be able to acquire knowledge of material and inventory management of garments industry.
- To be able to understand the garments tools of planning and material handling.
- To be able to develop knowledge of garments product and service design.

SHORT DESCRIPTION

Production planning; Tools of planning; Materials handling; Product and service design; Material management; Inventory management; Scheduling.

DETAIL DESCRIPTION

1 Understand the production planning.

1.1 Define planning.
1.2 Define production planning.
1.3 Describe garments production planning schedule.
1.4 Describe the objects of production planning.
1.5 Describe the criterias or points before going to production.
1.6 Describe the characteristics of effective production planning.
1.7 Describe the information required for effective production planning.

2 Understand the tools of planning.

2.1 Describe the tools of planning.
2.2 Classify the tools of planning.
2.3 Define work study.
2.4 Describe the purpose of work study.
2.5 Describe the importance of work study.
2.6 Describe the procedure of work study.
2.7 Mention the fields of application of work study.
2.8 Define work measurement.
2.9 Describe the procedure of work measurement.
2.10 Describe time study.
2.11 Describe the procedure of time study.
2.12 Describe motion study.
2.13 Describe the application of tools in garments factory.

3 Understand the material handling.

3.1 Define material handling.
3.2 Describe the importance of material handling.

3.3 Mention the classification of handling.
3.4 Mention the objectives of handling.
3.5 Describe the procedure of handling.

4 Understand the product and service design.

4.1 Describe project and service design.
4.2 Describe different types of process of product design.
4.3 Describe different types of flow diagram of product design.
4.4 Describe the operational classification of services & designing of service.
4.5 Describe the structure of services encourter.

5 Understand the material management.

5.1 Define material management.
5.2 Describe purchase conditions.
5.3 Describe distribution consideration.
5.4 Describe measurements of performance.
5.5 Describe the strategy of supply chain.
5.6 Describe the dynamics of supply chain.

6 Understand the inventory control management.

6.1 Define inventory management.
6.2 Describe inventory control system (P & Q system).
6.3 Describe economic order quality models including single period and discounting situation in economic order of quantity (EOQ).

7 Understand the scheduling.

7.1 Describe scheduling of key manufacturing of garments.
7.2 Describe job shop dispatching.
7.3 Describe the sequences of operations for single and multi machines.
7.4 Describe scheduling customer demand & scheduling work force.
7.5 Describe just in time, scheduling system and JIT gant chart.

4954	GARMENTS PATTERN MAKING – II	T	P	C	
			0	3	1

AIMS

To be able to develop skill and attitude in the area of garments pattern making with special emphasis on:

- human body shape & measurements
- basic of pattern making
- basis of garments design
- comforts & garments design.

SHORT DESCRIPTION

Application of upper body; Creation of the bodies block; Neclines making; jacket pattern making; Coat pattern making.

DETAIL DESCRIPTION

1 Perform the application of upper body.
- 1.1 Identify the measuring body shape related to age.
- 1.2 Identify sizing and ranges for global production.
- 1.3 Create production pattern for basic trouser for men.

2 Perform the creation of bodies block.
- 2.1 Make the block through seams.
- 2.2 Make neck lines and fullnes.
- 2.3 Develop toile form flat pattern.

3 Perform the necklines making.
- 3.1 Make necklines.
- 3.2 Make collar reveres.
- 3.3 Prepare opening & fastening.
- 3.4 Make necklines as fasionable dress and shirt style.

4 Perform jacket pattern making.
- 4.1 Take the measurements for making patterns for men’s jacket.
- 4.2 Prepare pattern making of men’s jacket.
- 4.3 List the materials to prepare a jacket.
- 4.4 Make a jacket pattern.

5 Perform coat pattern making.
- 5.1 Make the measurements for making patterns for a coat.
- 5.2 Prepare pattern making of men’s coat.
- 5.3 List the materials to prepare a coat.
- 5.4 Make a coat pattern.

2621	SPREADSHEET ANALYSIS	T	P	C
		0	3	1

AIMS

- To provide skill on spreadsheet applications.
- To develop skill on database management.
- To develop skill in creating graphs.

SHORT DESCRIPTION

Spreadsheet fundamentals; Applications of spreadsheet; Using worksheet; Apply formula and functions in worksheet; Database management, Creating & printing graphs; Create simple macros.

DETAIL DESCRIPTION

1 Apply the basic skills of a spreadsheet software package

1.1 Run a spreadsheet software package.
1.2 Identify and use different areas (working area, border area, control panel, mode indicator, status indicator, date & time indicator) of the worksheet screen.
1.3 Identify the function of different keys (typing key, calculator key, text key, cursor key and function key, etc.) of the keyboard.
1.4 Move around the worksheet using keys and combination of key.
1.5 Identify and use the on-screen help facility.
1.6 Identify and use the types of data, numbers, labels and formula.
1.7 Discover menus, submenus, pop-up menu, etc.

2 Manage workbooks and windows.

2.1 Make and use workbooks.
2.2 Access different types of files.
2.3 Open files as read only.
2.4 Demonstrate the options for saving files.
2.5 Display a workbook in more than one window
2.6 Work with more than one workbook.
2.7 Close a workbook.

3 Create a worksheet and use simple commands.

3.1 Activate entries in a worksheet.
3.2 Use edit key (F2) to correct or to modify entries.
3.3 Activate the command menus and select commands.
3.4 Save the work sheet.
3.5 Exit from spreadsheet and return to DOS.

3.6 Retrieve a previously saved worksheet.
3.7 Modify the worksheet.
3.8 Save a modified worksheet.
3.9 Print the worksheet.

4 Apply formulae and functions.

4.1 Use simple formulae to solve arithmetical computation.
4.2 Use arithmetical operators in formulae and logical formulae.
4.3 Edit formulae.
4.4 Use mathematical functions to solve simple equations.
4.5 Change the evaluation order.
4.6 Control the worksheet calculation.

5 Solve engineering problems using formula and functions.

5.1 Use mathematical functions to compute trigonometric values, absolute values, random number, square root, logarithmic values, etc for solving engineering problems.
5.2 Use logical functions to perform an operation depending on a condition in engineering problem.
5.3 Use statistical functions to compute summation, average, minimum value, maximum value, etc in engineering problem.

6 Show skill in using templates.

6.1 Open new files based on templates.
6.2 Make and use workbook templates.
6.3 Make changes in existing workbook templates.
6.4 Validate numbers, dates, times & text.
6.5 Show custom validation.

7 Work with cell addresses and cell ranges.

7.1 Use GOTO key to move the cell pointer to a particular cell.
7.2 Use the ABSOLUTE KEY to change cell addresses from one form to another in formulae or in functions.
7.3 Enter range in formulae or in functions by typing directly or by using cell pointer.
7.4 Produce a named range.
7.5 Use named range in formulae or functions.
7.6 Copy cell ranges (one to one, one to many and many to many) with special attention for copying formulae and functions.
7.7 Move cell ranges.
7.8 Erase cell ranges.

8 Forma a worksheet.

8.1 Change the width of a column, a range of column, and change the columns width globally.
8.1 Insert blank columns and blank rows in a worksheet.
8.2 Delete columns and blank rows in a worksheet.

8.3 Format the display of data of a worksheet globally or by referring a range of cells (e.g. currency format, exponential format, comma format, etc.).
8.4 Format the display of date and time of a worksheet globally or referring a range of cells.
8.5 Protect worksheet functions, formulae/important text and unprotect a range for entering entries.
8.6 Work with window for viewing a worksheet in different ways and freeze rows or columns to use them as titles.
8.7 produce, change and delete a style.

9. Exercise on setting up worksheet for printing.

9.1 Show the look of printed pages.
9.2 Change or adjust margins.
9.3 Produce and use page headers of footers.
9.4 Set print area, print titles and different print options.
9.5 Print sections of a worksheet formulae and few pages.
9.6 Print ranges from different worksheets on the same pages.

10. Solve simultaneous linear equations using matrix multiplication.

10.1 Multiply two matrices.
10.2 Compute the inverse of a matrix.
10.3 Solve simultaneous equations (from 2 to 5 equations) with the help of matrix applied in engineering subjects).

DATABASE MANAGEMENT

11. Use database management.

11.1 produce a database program.
11.2 Sort a database in different ways.
11.3 Search a record from the database using a search criteria.
11.4 Extract records from the database that match a given criteria.
11.5 Delete records that match a given criteria from the database using available database commands.

CREATING & PRINTING GRAPHS

12. Create graphs.

12.1 Produce bar, line, X-Y and pie graphs.
12.2 Add color, titles, legend, grid and data levels to the graph.
12.3 Add visual impact with colors.
12.4 Produce linked pictures.
12.5 Save the graphs and assign names to different graphs of a single worksheet.

13. Print graphs.

13.1 Print graphs (low or high quality graphs).
13.2 Plot graphs using a plotter using different colors.
13.3 Change graphs size, print & plot them.

MACROS & MACRO COMMAND LANGUAGES

14. Create macros.

14.1 Produce simple macros (e.g. to change the width of a cell, to format a cell display, to erase a range of cells, etc.) using keystroke commands.

15. Create macros using macro command languages.

15.1 Produce a macro to convert values into labels and vice versa.

15.2 Produce a macro for inserting alternate blank rows between two rows of data in a worksheet.

15.3 produce a macro for deleting the inserted blank rows in a worksheet.

2622	PROGRAMMING IN C	T	P	C
		2	3	3

AIMS

- To develop knowledge and skill to prepare programs in C.
- To develop knowledge and skill to compile, debug & test C programs.

SHORT DESCRIPTION

Basics of C program; Data types; Variables; Operators; Expression; Input-output statements; Control flow statements; Arrays; Functions Preprocessors; Pointers; Structures and Unions; File operations; Graphics.

DETAIL DESCRIPTION

Theory:

BASICS OF C PROGRAM

1 Understand fundamentals of C Programming.

1.1 Describe the historical development of C Programs.
1.2 Describe the program format and programming style in C.
1.3 State the difference of C with other high level languages.
1.4 Explain the process of program planning.
1.5 Describe algorithm and flow charts.
1.6 Prepare algorithm and flow chart for simple problems.
1.7 State the process of compiling C program.

DATA TYPES, VARIABLES, OPERATORS AND EXPRESSIONS

2 Understand data types, constants and variables.

2.1 Describe the types of data in C.
2.2 Explain constants and variables in C.
2.3 Describe the keywords and identifiers in C.
2.4 Mention the use of qualifiers in data types.
2.5 Declare variables and assign values to variables.
2.6 Describe auto and register storage class.
2.7 State the type conversion and type definition in C.
2.8 Explain the process of creating array with four primitive data types.

3 Understand Operators and expressions.

3.1 State C operators and their classification.
3.2 Describe the arithmetic, relational and logical operators.
3.3 Describe assignment, increment and decrement of operators.
3.4 State conditional operators.

3.5 Explain bit wise and special operators.
3.6 Write arithmetic expression & its evaluation order in C.
3.7 Describe the precedence of arithmetic operators.
3.8 Explain the operator precedence and its associativity.

INPUT & OUTPUT STATEMENTS

4 Understand the input and output operations.

4.1 Describe the statement getting input from keyboard.
4.2 Describe the statements printing output on screen and by printer.
4.3 State the codes used for formatted I/O.
4.4 Mention the escape sequences in C.
4.5 Prepare simple programs using I/O operations.

CONTROL FLOW STATEMENTS

5 Understand the flow of control in C programming.

5.1 Describe the conditional and unconditional program flow.
5.2 State the statement for conditional and unconditional branching.
5.3 Explain the statements for looping.
5.4 Describe the use of exit and continue statements.
5.5 Prepare programs using above statements.

ARRAYS

6 Understand arrays.

6.1 Define arrays.
6.2 Describe the dimension of arrays.
6.3 Initialize arrays.
6.4 Write program using arrays.

PREPROCESSORS

7 Understand preprocessor statements in C.

7.1 Describe the preprocessor directives and their functions.
7.2 Define header.
7.3 Describe the process of including header in routine.
7.4 Explain the use of macro.
7.5 Describe advantage of macros over functions in programming.

POINTERS & FUNCTIONS

8 Understand pointer and its application.

8.1 Define pointer.
8.2 Describe the characteristics of pointer.
8.3 Explain pointer expressions.
8.4 Write programs using pointers.

9 Understand function.

9.1 Explain function.
9.2 Describe the process of calling functions and returning from functions in C.
9.3 Describe arguments used in functions.
9.4 Explain call by reference and call by value.

9.5 Mention function prototype.
9.6 Describe the use of arrays and pointers in function arguments.
9.7 Explain the external and static storage class.

STRUCTURE AND UNION

10 Understand structure and union.

10.1 Describe structure.
10.2 Mention structure declaration.
10.3 State the use of member operator.
10.4 Describe the declaration of structure array.
10.5 Mention nested structure.
10.6 Describe the use of pointer in structure declaration.
10.7 State union and its importance.
10.8 Distinguish between structure and union.

FILE OPERATIONS

11 Understand file operations.

11.1 Describe file operations.
11.2 State the modes of opening files.
11.3 Describe the functions that support character I/O.
11.4 Explain the routines for performing formatted I/O to files.
11.5 Describe the redirection of input and output.
11.6 Define pipe.
11.7 State the error handling tools.
11.8 Prepare programs for reading, writing and editing files.

GRAPHICS

12 Understand graphics and its application.

12.1 Describe how graphics are created in computers.
12.2 State resolution.
12.3 Describe the graphic statements for creating point, line, circle, arc and polygon.
12.4 Describe the statements required for selecting color and filling shapes by color.
12.5 State the statements for view port.
12.6 Describe the use of text of different sizes and fonts.
12.7 Describe the statements used to copy and move text & graphics.

Practical :

1 Produce programs using simple arithmetical expression to display result on the screen and on paper.

2 Produce programs using unconditional and conditional branching (e.g. to compute the roots of a quadratic equation, to find maximum or minimum number from a set of numbers, to compute depreciation, etc).

3 Produce programs using looping (eg. to compute the sum or average of natural numbers, odd numbers & even numbers, to compute the sum of an infinite series until a given condition is met, etc).

4 Produce programs using nested looping (eg. searching prime numbers, to generate fibonacci numbers, etc)

5 Produce programs using library functions (e.g. to solve scientific or engineering problems which involves trigonometric, logarithmic, exponential functions, etc).

6 Produce programs defining functions (e.g. to solve scientific or engineering problems which involves trigonometric, logarithmic, exponential functions, etc).

7 Produce programs using subroutines (e.g. computation of monthly payroll, etc)

8 Produce programs using one dimensional array (e.g. to sort numbers or names in ascending or descending order, to display the temperatures of a week by a bar chart, etc).

9 Produce programs using two dimensional arrays (e.g. to print numbers in a matrix form, to print tabular data with rows and columns interchanged, to multiply two matrices, etc).

10 Produce programs for manipulating strings (e.g. to print the value of a string variable at the center of a line, to print the ASCII values of characters, to scramble a word, etc).

11 Produce programs for processing sequential files (e.g. to store information to or to read information from a sequential data file).

12 Produce programs for processing random files (e.g. to store information to or to read information from a random data file).

13 Programs for simple graphics using points, lines and boxes (e.g. to draw geometrical shapes, to draw a given function, etc).

14 Produce programs for graphics using circles and arcs (e.g. to draw a pie chart, to draw shape of cylinder, etc).

1451 APPLIED MATHEMATICS – II

T	P	C
2	3	3

AIMS

- To be able to apply differentiation, differential operator and vector integration in finding length, area, volume and different terms of science & technology.
- To be able to use the knowledge of stokes theorem to transfer the volume integration into line integration.
- To be able to use the knowledge of differential equation to solve the problems of hydro-dynamics and velocity of a particle in space.
- To use the knowledge of Laplace transformation to solve the boundary differential equations and to find the impedance and reactance of the electric circuit.

SHORT DESCRIPTION

Vector : Vector differentiation; Differential operator; Vector integration; Green's theorem; Divergence theorem and stokes Theorem.

Integral Calculus: Special types of integration; Reduction formula; Properties of definite integration.

Differential Equation : Solution of second order differential equation; Series solution; Laplace transformation.

DETAIL DESCRIPTION

Vector :

1. Understand vector differentiation.

1.1 Explain the differentiation of Vectors.

1.2 Differentiate the vector function using

i) General rules of differentiation.

ii) General rules of partial differentiation.

1.3 Solve the problems related to vector differentiation.

2. Understand the vector differential operator.

2.1 Define vector differential operator.

2.2 Define gradient, divergence and curl.

2.3 Mention the formulae involving vector differential operator.

2.4 Solve the problems related to vector differential operator, gradient, divergence and curl.

3. Understand vector integration.

3.1 Interpret the following vector integration :

i) The line integral.

ii) The surface integral.

iii) The volume integral.

3.2 Solve problems related to vector integration.

4. Understand the theorems of vector integration.

4.1 State Greens theorem in the plane.

4.2 Express the proof of Green's theorem.

4.3 State Gauss divergence theorem.

4.4 Express the proof of Gauss divergence theorem.

4.5 State and prove stokes theorem.

4.6 Solve simple problems using Green theorem, Gauss divergence theorem and Stokes theorem.

Integral Calculus

5. To perform the special types of integration.

5.1 Integrate of the following form :

(i) $\int \frac{dx}{ax^2+bx+c}$ (ii) $\int \frac{dx}{\sqrt{ax^2+bx+c}}$

(iii) $\int \sqrt{ax^2+bx+c}dx$ (iv) $\int \frac{dx}{(ax+b)\sqrt{cx+d}}$

(v) $\int \frac{dx}{(ax+b)\sqrt{ax^2+bx+c}}$ (vi) $\int \frac{px+q}{ax^2+bx+c}dx$

6. Understand the reduction formulae.

6.1 Express the deduction of reduction formula for

i) $\int \sin^n x\,dx$ ii) $\int \cos^n x\,dx$

iii) $\int x^n e^n\,dx$ iv) $\int x^n \cos x dx$, when n is even and when n is odd.

Obtain reduction formula for $\int \sin^m x \cos^n x\,dx$

6.2 Solve problems related to reduction formulae.

7. Understand Beta function and Gamma function of definite integrals.

7.1 Discuss the properties of definite integration.

7.2 State Wall's formula.

7.3 Express the proof of Wall's formula.

7.4 Define Gamma function and Beta function.

7.5 Express the proof of B(m, n) = $\frac{\Gamma m\ \Gamma n}{\Gamma m+n}$

7.6 Prove the formula $\int_a^{\frac{\pi}{2}} \sin^m x \cos^n x dx = \frac{\sqrt{\frac{m+1}{2}} \sqrt{\frac{n+1}{2}}}{2\sqrt{\frac{m+n+2}{2}}}$

7.7 Solve problems related to properties of definite integration and Gamma & Beta function.

Differential equation

8. Understand second order differential equation.

8.1 Solve linear equations with constant co-efficient.

8.2 Solve linear equations with variable co-efficient.

8.3 Solve the differential equation of the form $f(D)y = f(x)$

9. Understand Laplace transformation.

9.1 Define Laplace transformation in the form F (s) = $\int_0^{\infty} f(l) e^{-st} \quad dt$

9.2 Express the deduction of Laplace transformation of the followings functions :

i) constant (ii) t (iii) t^n (iv) e^{at}

(v) sin at (vi) cos at (vii) $e^{at} t^n$ (viii) $e^{at} \sin bt$

(ix) $e^{at} \cos bt$ (x) sin h at (xi) cos h at

9.3 Find the Laplace transformation of

(i) $f'(t)$ (ii) $f''(t)$ (iii) $f'''(t)$

9.4 Define inverse Laplace transformation.

9.5 Solve second order differential equation with the help of Laplace transformation.

9.6 Solve problems related to Laplace transformation and inverse Laplace transformation

1355	ENVIRONMENTAL MANAGEMENT	T	P	C
		2	0	2

AIMS

- To be able to understand the basic concepts of environment and environmental pollution.
- To be able to understand the concepts of ecology, ecosystems, air pollution, water pollution, soil pollution, radioactive pollution, sound pollution, etc.
- To be able to understand the methods of controlling air pollution, water pollution and sound pollution.
- To be able to understand the management of waste, pesticide pollution and soil pollution.
- To be able to understand the global environmental issues and the environmental problems in Bangladesh.

SHORT DESCRIPTION

Basic concepts of environment; Ecology & eco-systems; Air and atmospheric regions; Toxic chemicals, gases, vapours, fumes, pesticides & microbials; Air pollution and its sources & effects; Green house effect and depletion of ozone layer; Control of air pollution; Water pollution and its sources & effects; Monitoring of water pollution; Waste water treatment; Sound pollution and its control; Soil pollution and its management; Radioactive pollution and its control; Solid waste management; Major environmental issues in Bangladesh; Arsenic pollution in Bangladesh; Pesticides pollution and its management in Bangladesh; Environmental frame work and policy in Bangladesh; National environmental legislations and guidelines; Global environmental issues and the international conventions & earth summits held on environment.

DETAIL DESCRIPTION

1 Understand the basic concepts of environment.

1.1 Define environment.
1.2 Mention the main components of environment.
1.3 Describe the environment of a house.
1.4 Describe natural environment, man-made environment and social environment.
1.5 Mention the functions of environment.
1.6 Define the following environmental terms :
Marine environment, Estuarine environment, Terrestrial environment, Freshwater environment, Environmental education, Nutrients, Material particles, Solar capital, Earth capital, Mangrove forest, Photo-chemical oxidant, Population growth, Zero population growth, Sustainable society,

Pollutant, Contaminant, Receptor, Sink, Pathways of pollutant, Speciation.

2 Understand ecology and eco-systems.

2.1 Define ecology and eco-system.
2.2 Describe the biotic and abiotic components of eco-system.
2.3 Explain how does eco-system work.
2.4 Mention the range of tolerance in eco-system.
2.5 Mention the stability of eco-system.
2.6 Describe the following bio-geochemical cycles of eco-system.
a) Carbon cycle
b) Nitrogen cycle
c) Phosphorus cycle
d) Sulphur cycle.

2.7 Describe the following ecological terms:
Food chain, Food web, Biomass, Ecological pyramid, Pyramid of biomass, Pyramid of energy, Bio-concentration, Bio-magnification, Restoration ecology.

3 Understand the air and the atmospheric regions.

3.1 Define the following terms:
Air, lithosphere, hydrosphere, biosphere, atmosphere, troposphere, stratosphere, mesosphere, thermosphere, ionosphere and exosphere.
3.2 Mention the average composition of the atmosphere at the sea level.
3.3 Describe the chemical species and particulates present in the atmosphere.
3.4 Explain that atmosphere of the earth is an oxidizing environment.
3.5 Describe the chemical reactions occur in the atmosphere.
3.6 Describe the ozone layer in the atmosphere and its importance.
3.7 Describe the filtration of solar radiation in the atmosphere.

4 Understand the toxic chemicals, gases, vapors, fumes, pesticides and microbails which are hazardous to environment.

4.1 Define toxic substance.
4.2 Make a list of toxic chemicals, gases, pesticides, microbailes, vapors and fumes which are hazardous to human life.
4.3 Make a list of naturally occurring toxicants.
4.4 Mention the names of main hazardous substances present in the atmospheres.
4.5 List the toxic elements found in water.

5 Understand the air pollution and its sources & effects.

5.1 Define air pollution.
5.2 Mention the composition of clean dry atmospheric air.
5.3 List the air pollutants.
5.4 Describe the sources of air pollution.

5.5 Describe the effects of air pollution on human health, animals, plants and non-living things.
5.6 Explain the formation of photo-chemical smog and its effect.
5.7 Describe the acid rain and its causes & effect on eco-system.
5.8 Describe the disasters of major air pollution in the world mentioning location, causes and effects.

6 Understand the "Green House Effects" and depletion of Ozone layer.

6.1 Mention green house gases.
6.2 Describe the green house effects.
6.3 Mention the predictions of global warming and climate changes.
6.4 Describe ozone layer depletion and its causes.
6.5 Mention the steps to be taken in Bangladesh for the protection of ozone layer depletion and green house effect.

7 Understand the control of air pollution at the emission of the pollutant sources.

7.1 Mention the method of control of air pollution by the correction of pollution sources.
7.2 Describe the method of cleaning air or gaseous effluents by gravitational setting chamber.
7.3 Describe the method of air and gas cleaning by cyclone separator.
7.4 Describe the method of air or gaseous effluent cleaning by wet scrubber.
7.5 Describe the method of air cleaning by fabric filter system.
7.6 Describe the method of air and gas cleaning by electrostatic precipitator.
7.7 Describe the method of cleaning air gas by centrifugal scrubber.
7.8 Describe the method of cleaning exhaust air of automobile behicle by catalytic converter.

8 Understand the water pollution and its sources & effects.

8.1 Define water pollution.
8.2 Mention the specification of ideal water as per recommendation of the World Heath Organization (WHO).
8.3 List the different types of water pollutants.
8.4 Describe the sources of water pollution.
8.5 Describe the effects of water pollution on human health, animal, plants and environment.
8.6 Mention the major water pollution disasters of the world mentioning location, causes and effects on environment.

9 Understand the monitoring of water pollution.

9.1 Define the following terms:
(i) Dissolved oxygen (DO).
(ii) Biochemical oxygen demand (BOD).
(iii) Chemical oxygen demand (COD).

(iv) Total oxygen carbon (TOC).
(v) Threshold limit value (TLV).

9.2 Describe the method of determination of dissolved oxygen (DO) in a sample of water.
9.3 Describe the method of determination of biochemical oxygen demand (BOD) in a sample of water.
9.4 Describe the method of determination of chemical oxygen demand (COD) in a sample of water.
9.5 Describe the method of determination of total organic carbon (TOC) in a sample of water.
9.6 Mention the method of determination of nitrogen and phosphorus in a sample of water.
9.7 Mention the method of determination of pH value of water.
9.8 Mention the methods of determination of microbials present in a sample of water.

10 Understand the waste water treatment.

10.1 Define the primary treatment, secondary treatment and tertiary treatment of waste water.
10.2 Mention the methods of primary and secondary treatment of industrial waste water.
10.3 Describe the activated sludge process of industrial waste water treatment.
10.4 Describe the trickling filters method of industrial waste water treatment.
10.5 Describe the method of sludge treatment in biological waste water treatment plant.
10.6 Describe the methods of removal of suspended solid, nitrogen and phosphorus from waste water.
10.7 Mention the advanced biological system for waste water treatment.
10.8 Describe the chemical oxidation method of waste water treatment.

11 Understand the sound pollution and its control.

11.1 Define sound, sound wave and sound pollution.
11.2 Mention the classification of sound.
11.3 Mention the sources of sound pollution.
11.4 Describe the effect of sound pollution on human health.
11.5 Describe the causes of sound pollution.
11.6 Mention the scale of measuring sound intensity.
11.7 Describe the methods of control of sound pollution.

12 Understand the soil pollution and its management.

12.1 Define soil pollution.
12.2 List the different soil pollution.
12.3 Describe the classification of soil pollution.
12.4 Mention the sources of soil pollution.
12.5 Mention the damaging effect of soil pollution.

12.6 Describe the effect of soil pollution on human health.
12.7 Describe the management of soil pollution.

13 Understand the radioactive pollution and its control.

13.1 Define radioactive pollution.
13.2 Mention the sources of radioactive pollution.
13.3 Describe the causes of radioactive pollution.
13.4 Mention the environmental pollution from radioactive waste.
13.5 Describe the effect of radioactive pollution on human health.
13.6 Describe the method of control of radioactive pollution.

14 Understand the solid waste management.

14.1 Define solid waste.
14.2 List the sources of solid waste.
14.3 Mention the classification of solid waste.
14.4 Mention the methods of collection of solid waste.
14.5 Describe the potential method of disposal of solid waste.
14.6 Describe the recycling of solid wastes.
14.7 Describe waste management by vermi composting.
14.8 Mention the waste management strategies in Bangladesh.

15 Understand the major environmental issues in Bangladesh.

15.1 List the major environmental issues in Bangladesh.
15.2 Describe the causes of flood, cyclone, tidalbore, soil erosion, droughts, earthquakes and salinity in Bangladesh.
15.3 Mention the population growth in Bangladesh and its effect in the environment of the country.
15.4 Describe the marine, river and wet land pollution in Bangladesh mentioning its causes & effects in the environment.
15.5 Describe deforesting and its effect in biodiversity in the country.
15.6 Describe the causes of increasing salinity in Bangladesh and its effect in the environment.
15.7 Mention the causes of increasing draught in Bangladesh and its effect in the country.

16 Understand the arsenic pollution in Bangladesh.

16.1 Mention the arsenic pollution of water in Bangladesh.
16.2 Describe the effects of arsenic pollution in water on human health and on environment in Bangladesh.
16.3 Describe the causes of arsenic in ground and underground water.
16.4 Describe the quality standard of arsenic contaminated water.
16.5 Describe the tests for arsenic in water.
16.6 Describe the remedial measure of arsenic in water.
16.7 Describe the principle of construction of a Arsenic Removal Plant (ARP) from arsenic contaminated water.

17 Understand the pesticide pollution in Bangladesh and its management.

17.1 Define pesticide.

17.2 Make a list of pesticides.
17.3 Mention the causes of pesticide pollution in Bangladesh.
17.4 Describe the effect of pesticide pollution in the environment.
17.5 Mention the bed effect of use of organo-chlorine insecticide on environment.
17.6 Describe the mode of action of DDT, toxaphenes, heptachlor, aldrion dialdrin and derivatives of phosphoric acid and their effects on environment.
17.7 Mention the modern insecticides and their effects on environment.
17.8 Describe the management of pesticides control.

18 Understand the environmental frame work and policy in Bangladesh.

18.1 List the name of the organization and research institutions engaged for the environmental research in Bangladesh.
18.2 Describe the environmental frame work in Bangladesh.
18.3 Describe the functions of Environment Management Action Plan (NEMAP).
18.4 Describe the environment policies and laws of Bangladesh.
18.5 Mention the Environmental Impact Assessment (EIA) and its importance in Bangladesh context.
18.6 Describe the activities of directorate of environment of Bangladesh.

19 Understand the national environmental legislations and guidelines.

19.1 Mention environmental act and legislations prescribed for air and water quality.
19.2 Describe environmental act prescribed for industries in Bangladesh.
19.3 Describe the guide lines of environment prescribed for industries in Bangladesh.
19.4 Describe environmental act prescribed for solid waste deposit.
19.5 Describe environmental act prescribed for forest park and wild-life preservation in the country.
19.6 Describe environmental act prescribed for urbanization in the country.

20 Understand the global environmental issues and the international conventions & earth summits held on environment.

20.1 Mention the main issues of global environment.
20.2 Describe the conventions and earth summits held on environment in different places of the world.
20.3 Mention the global steps taken to minimize green house effect and ozone layer depletion.
20.4 Mention the causes of raising water level of global sea and its consequences.
20.5 Describe the global issue on sharing of surface water and its importance.
20.6 Describe global environmental quality standard.

REFERENCE BOOKS

১. পরিবেশ ও দূষণ – গৌতম পাল

২. আধুনিক পরিবেশ রসায়ন – প্রফেসর মোহাম্মদ মহির উদ্দিন

৩. বিপন্ন পরিবেশ ও বাংলাদেশ – ডঃ এফ এম মনিরুজ্জামান

৪. পরিবেশ দূষণ (১ম ও ২য় খন্ড) – আবদুল মালেক ভূইয়া

৫. পরিবেশ রসায়ন – মোসাম্মৎ সামসুন নাহার

৬. পরিবেশ ও জৈবিক বালাই ব্যবস্থাপনা – ডঃ সন্তোষ কুমার, ডঃ মোঃ আবদুল খালিক, মোসলেহ উদ্দিন আহমদ ও ডঃ আনোয়ারুল আজিম

৭. বায়ু ও পানি দূষণ এবং প্রতিকার – মুহাম্মদ কাউছার হাবিব ভূইয়া

৮. পরিবেশ বিজ্ঞান – মুহাম্মদ কাউছার হাবিব ভূইয়া

৯. শব্দ ও তেজস্ক্রিয় দূষণ এবং প্রতিকার – মুহাম্মদ কাউছার হাবিব ভূইয়া

১০. মাটি ও তেজস্ক্রিয় দূষণ এবং প্রতিকার – মুহাম্মদ কাউছার হাবিব ভূইয়া

11. Environmental Chemistry – Anil Kumar De

12. Pollution control in process industries – S. P. Mahajan

13. Environmental Chemistry – Samir K Banerji

14. Industrial pollution – V. P. Kudesia

15. Environmental pollution control engineering – C. S. Rao

16. Environmental Engineering – A. P. Sincero and G. A. Sincero

17. Environmental Engineering – Peavy, Rowe and Techobanglous

18. Air pollution – V. P. Kudesia

19. Industrial Noise Control – Bruce Fader

20. Pesticide Pollution
   – Kudecsia and Charaya
21. Water Pollution
   – V. P. Kudesia
22. Safety Evaluation of Environmental Chemicals
   – T. S. S. Dikshith
23. Peoples Report on Bangladesh Environment 2001
   – Atia Rahman, M. Ashraf Ali and Farooque Choudhury

1551 BOOK KEEPING AND ACCOUNTING **T P C**
2 0 2

AIMS

- To be able to understand the principles and practices of book keeping and accounting.
- To be able to understand the procedures of general accounting, financial accounting and their applications.

SHORT DESCRIPTION

Concept of book keeping and accounting; Transactions; Entry systems; Accounts; Journal; Ledger; Cash book; Trial balance; Final accounts; Cost account & financial accounting; Depreciation; Public works accounts.

DETAIL DESCRIPTION

1 Understand the concept of book keeping and accounting.
- 1.1 Define book keeping and accountancy.
- 1.2 State the objectives of book keeping.
- 1.3 State the advantages of book keeping.
- 1.4 Differentiate between book keeping and accounting.
- 1.5 State the necessity and scope of book keeping and accounting.

2 Understand the transactions.
- 2.1 Define transactions and business transaction.
- 2.2 Explain the importance of transactions.
- 2.3 Describe the characteristic features of transactions.
- 2.4 Discuss the classification of transaction.
- 2.5 Identify the transaction from given statements stating reasons.

3 Understand the entry system.
- 3.1 State the aspects of transactions.
- 3.2 Define single entry system.
- 3.3 State the objectives of single entry system.
- 3.4 Discuss the disadvantages of single entry system.
- 3.5 Define double entry system.
- 3.6 Discuss the principles of double entry system.
- 3.7 Justify whether double entry system is an improvement over the single entry system.
- 3.8 Distinguish between single entry and double entry system of book keeping.

4 Understand the classification of accounts.
- 4.1 Define accounts.
- 4.2 State the objectives of accounts.

4.3 Illustrate different type of accounts with example.
4.4 Define “Golden rules of Book keeping”.
4.5 State the rules for “Debit” and “Credit” in each class of accounts.
4.6 Determine Debtor (Dr) and Creditor (Cr.) from given transactions applying golden rules.
4.7 Define accounting cycle.
4.8 State the different steps of accounting cycle.

5 Understand the Journal.

5.1 Define Journal.
5.2 State the object of Journal.
5.3 State the functions of Journal.
5.4 Mention the various names of Journal.
5.5 Interpret the form of Journal.
5.6 Journalize from given transactions.

6 Understand the ledger.

6.1 Define ledger.
6.2 Interpret the form of ledger.
6.3 State the functions of ledger.
6.4 Distinguish between Journal and Ledger.
6.5 Prepare ledger from given transactions.
6.6 Explain why ledger is called the king of all books of accounts.

7 Understand the cash book.

7.1 Define cash book (single, double and triple column).
7.2 Explain cash book as both Journal and Ledger.
7.3 Prepare double column cash book from given transactions showing balances.
7.4 Prepare triple column cash book from given transaction and find out the balances.
7.5 Define petty cash book.
7.6 Prepare analytical and imprest system of cash book.
7.7 Define discount.
7.8 Explain the different types of discount.

8 Understand the trial balance.

8.1 Define trial balance.
8.2 State the object of a trial balance.
8.3 Discuss the methods of preparation of a trial balance.
8.4 Explain the limitations of a trial balance.
8.5 Prepare trial balance from given balance.

9 Understand the final accounts.

9.1 State the components of final account.
9.2 Distinguish between trial balance and balance sheet.
9.3 Identify the revenue expenditure and capital expenditure.

9.4 Select the items to be posted in the trading account, profit & loss account and the balance sheet.
9.5 State the adjustment to be made from the given information below or above the trial balance.
9.6 Prepare trading account, profit & loss account and balance sheet from the given trial balance & other information.

10 Understand the cost and financial accounting.

10.1 Define financial accounting.
10.2 State the objectives of financial accounting.
10.3 Define cost accounting.
10.4 Discuss the relationship between financial Accounting and cost accounting.
10.5 State the elements of direct cost and indirect cost.
10.6 Prepare cost sheet showing prime cost, factory cost, cost of production, total cost and selling price.
10.7 Explain the following terms:
- a. Fixed cost
- b. Variable cost
- c. Factory cost
- d. Overhead cost
- e. Process cost
- f. Direct cost
- g. Operating cost
- h. Standard cost

11 Understand the depreciation

11.1 Define depreciation.
11.2 State the objects of depreciation.
11.3 Discuss the necessity for charging depreciation.
11.4 Describe the different methods of determining depreciation.
11.5 Explain the relative merits and demerits of different method of depreciation.

12 Understand the public works accounts.

12.1 State the important aspects of public works accounts.
12.2 Describe the main features of public works accounts.
12.3 Explain “Revenue and Grant”.
12.4 Define Value Added Tex (VAT)
12.5 State the merits and demerits of VAT.
12.6 Define Bill and Voucher.

1552 BUSINESS ORGANIZATION

T	P	C
2	**0**	**2**

AIMS

- To be able to understand the basic concepts and principles of business organization.
- To be able to understand the banking system and insurance policy in Bangladesh.
- To be able to understand the trade system and stock exchange activities in Bangladesh.

SHORT DESCRIPTION

Principles and functions of business organization; Formation of business organization; Purchasing functions and systems; Banking system and its operation; Negotiable instrument; Stock Exchange; Home trade and foreign trade; Insurance; provident fund and benevolent fund.

1 Understand business organization.

1.1 Define business.
1.2 Mention the objects of business.
1.3 Define business organization.
1.4 State the principles of business organization.
1.5 State the function of business organization.

2 Understand the formation of business organization.

2.1 Define soletradership, partnership and joint stock company.
2.2 Describe the formation of soletradership, partnership and joint stock company.
2.3 Mention the advantages and disadvantages of soletradership, partnership and joint stock company.
2.4 Discuss the role of co-operative society (producers co-operative and consumers co-operative) in Bangladesh.

3 Understand the purchasing functions and system.

3.1 Define purchasing.
3.2 Describe the five R (right quantity, right quality, right time, right price & right source) of purchasing principles.
3.3 State the function of purchase.
3.4 Discuss the purchasing procedure.

4 Understand the banking system and its operations.

4.1 Define bank.
4.2 State the service rendered by bank.
4.3 Describe the classification of bank in Bangladesh.
4.4 State the functions of Bangladesh Bank in controlling money market.

4.5 Mention the various name of commercial Bank in Bangladesh and their functions.
4.6 Describe the role of “Gramin Bank” in assisting small scale industries.
4.7 Mention different types of account operated in a bank.
4.8 Mention how different types of bank accounts are opened and operated.

5 Understand the negotiable instrument.

5.1 Define negotiable instrument.
5.2 Discuss the types of negotiable instrument.
5.3 Define cheque.
5.4 Describe different types of cheque.
5.5 Define bill of exchange.
5.6 Define hondi and letter of credit.

6 Understand the stock exchange.

6.1 Define stock exchange.
6.2 State the objects of stock exchange.
6.3 Explain the functions of stock exchange.
6.4 Mention the procedure of membership of stock exchange.
6.5 Discuss the procedure of transaction in stock exchange.
6.6 Explain the stock exchange systems in Bangladesh.

7 Understand the home trade.

7.1 Define home trade.
7.2 State the objects of home trade.
7.3 Define whole sale trade.
7.4 State the functions of whole sale trade.
7.5 Define retail trade.
7.6 State the advantages of retail trade.
7.7 Differentiate between whole sale trade and retail trade.

8 Understand the foreign trade.

8.1 Define foreign trade.
8.2 Mention the advantages and disadvantages of foreign trade.
8.3 Mention the classification of foreign trade.
8.4 Discuss the importance of foreign trade in the economy of Bangladesh.

9 Understand the insurance, pension compensation, provident fund and benevolent fund.

9.1 Define insurance.
9.2 Describe the essential conditions of insurance contract.
9.3 Describe life insurance, marine insurance, fire insurance, re-insurance and premium.
9.4 Discuss the types of insurance.
9.5 Distinguish between life insurance and general insurance.
9.6 State the pension policy of the government and autonomous bodies.
9.7 Explain the features of group insurance system and employees benevolent fund.

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM

GARMENTS DESIGN AND PATTERN MAKING TECHNOLOGY

SYLLABUS

SIXTH SEMESTER

4961	GARMENTS MANUFACTURING – III	T	P	C
		2	3	3

AIMS

To be able to develop knowledge, skill and attitude in the field of garments manufacturing with special emphasis on:

- interlining, fusing and coating
- feed mechanism of sewing machine
- sewing needles, sewing thread and sewing thread package.
- fault of sewing.

SHORT DESCRIPTION

Interlining; Fusing; Coating; Feed mechanism of sewing machine; Sewing needles; Sewing thread; Sewing thread package; Faults of sewing; Knit fabric; Machinery for seaming kit garments; Quality control of knit garments.

DETAIL DESCRIPTION

Theory:

1 Understand the interlining.

1.1 Define interlining.
1.2 Mention the classification of interlining.
1.3 Describe fusible interlining.
1.4 Mention the advantages of fusible interlining.
1.5 Distinguish between nonfusable interlining and fusible interlining.
1.6 Describe the properties of fusible interlining.
1.7 Describe different types of fusible interlining.

2. Understand the fusing.

2.1 Define fusing.
2.2 Mention the classification of fusing techniques.
2.3 Describe different fusing machines.
2.4 Describe hand iron & plat bed fusing machine.
2.5 Describe continuous fusing pros.
2.6 Describe high frequency fusing machine.
2.7 Describe different types of fusing.
2.8 Describe the quality control of fusing.

3 Understand coating.

3.1 Define resin coating.
3.2 Describe the purpose of resin coating.
3.3 Mention different methods of coating.
3.4 Describe resin coating.
3.5 Describe scatter coating.
3.6 Describe paste coating.
3.7 Describe film coating.
3.8 Describe emulsion coating.

4 Understanding the feed mechanisms of sewing machines.

4.1 Define feed mechanism of sewing machine.
4.2 Classify different feed mechanisms of sewing machine.
4.3 Describe the drop feed system.
4.4 Mention the limitation of drop feed system.
4.5 Describe differential bottom feed system.
4.6 Describe adjustable top feed system.
4.7 Describe needle feed systems.
4.8 Describe unision feed system.
4.9 Describe puller feed system.

5 Understand the sewing needle.

5.1 Describe sewing needle.
5.2 Mention function of sewing needle.
5.3 Describe needle sizing / number.
5.4 Mention the classification of sewing needle.
5.5 Describe the causes of needle bending during sewing.
5.6 Describe different needle points.
5.7 Describe needle cutting point & cloth point with stitch.

6 Understand the sewing thread.

6.1 Describe polyester, nylon & amaid sewing thread.
6.2 Describe textured and core-spun thread.
6.3 Describe the properties of sewing thread.
6.4 Describe metric ticket number system.
6.5 Describe the cotton ticket number system of sewing thread.

7 Understand the sewing thread package.

7.1 Define thread package.
7.2 Describe different thread packages.
7.3 Describe spool & cop.
7.4 Describe cone & vicone.
7.5 Describe container, large packages cocoon & pre wond bobbin.

8 Understand the knit fabric.

8.1 Mention the classification of yarn for production knit fabric.
8.2 Describe the properties of knit fabric.
8.3 Describe the process of knit fabrics production.

8.4 Mention the steps of knit garments production.
8.5 Describe different categories of knit garments according to general production materials.
8.6 Mention the production sequence of fully cut garments, stitch shaped cut, fully fashioned and integral.

9 Understand the machinery for seaming knit garments.

9.1 Mention the constructional features of sewing machine.
9.2 Describe the four bed type variations in use in the knit garments industries.
9.3 Mention the general view of dial linking machine.
9.4 Describe stitch forming action of conventional needle linking machine forming single chain stitch.

10 Understand the quality control of knit garments.

10.1 Describe knit fabric quality.
10.2 Find the weight per unit area and cover factor of knit fabric.
10.3 Describe the causes of different faults of knit garments with their remedies.
10.4 Mention the steps of quality control during the manufacturing of knit garments.

Practical:

1 Produce a sewn interlining.
2 Attach a sewn interlining to a garments component.
3 Attach fusible interlining to a garments component.
4 Determine bond strength of fused interlining.
5 Draw the components of a drop feed mechanism.
6 Disassemble the components and assemble the components of a drop feed mechanism.
7 Draw the diagram of a sewing machine needle and label the names of each part.
8 Draw the diagram of needle and label different parts of needle.
9 Draw the sewing thread packages.
10 Prepare knitted fabric.
11 Assess yarn quality of knit garments.
12 Assess fabric quality of knit garments.

4962 MAINTENANCE OF GARMENTS MANUFACTURING MACHINE

T	P	C
1	3	2

AIMS

To be able to develop knowledge, skill and attitude in the field of garments machine design and maintenance with special emphasis on:

- garments machine design and maintenance
- friction and power transmission
- material handling and air conditioning system in garments industries
- safety of garments factory.

SHORT DESCRIPTION

Machine design; Friction; Power transmission; Maintenance; Material handling; Air conditioning system in garments industry; Safety of garments industry; Maintenance procedure of different garment machines.

DETAIL DESCRIPTION

Theory:

1 Understand the machine design.
- 1.1 Describe the elements of machine design.
- 1.2 Describe tolerance and allowances.
- 1.3 Discuss loads and stress concentration.

2 Understand the friction.
- 2.1 Define friction.
- 2.2 Mention the limitation of friction.
- 2.3 Define co-efficient of friction.
- 2.4 Define screw friction.
- 2.5 Describe the friction of joint bearing.
- 2.6 Describe the friction clutches.
- 2.7 Describe rolling resistance.

3 Understand the power transmission.
- 3.1 Describe the methods of power transmission.
- 3.2 List the names of parts related to power transmission.
- 3.3 Mention different types of pully used for power transmission.
- 3.4 Mention different types of belt used for power transmission.
- 3.5 Mention different types of gear.
- 3.6 Describe the uses of gear and belt for power transmission.

4 Understand the maintenance.

4.1 Define maintenance.
4.2 Mention the purpose of maintenance.
4.3 Mention different types of maintenance.
4.4 Describe planning and organizing maintenance.
4.5 Describe the process repairing cycle & maintenance stages.
4.6 Describe lubrication and lubricants of garments machineries.
4.7 Describe the process of inspection of garments machineries.

5 Understand the material handling.

5.1 Mention the meaning of material handling.
5.2 Mention different types of conveyors.
5.3 Describe belt conveyor and chain conveyor.
5.4 Describe hydraulic press.
5.5 Describe lift system of hydraulic press.

6 Understand the air conditioning system in garments industry.

6.1 Describe comfort condition of garments industry.
6.2 Describe psychometric chart heating & cooling.
6.3 Describe dehumidityfication & humidification.
6.4 Describe ventilation, filtration & mill illumination.

7 Understand the safety of garments industry.

7.1 Describe industrial hazarads.
7.2 Mention safety measure taken for garments factory.
7.3 Mention safety rules.
7.4 Describe factory act.
7.5 Describe first aid and pollution centre.
7.6 Describe pollution created in garments factory.
7.7 Describe first aid needed for garments factory.

8 Understand the maintenance procedure of different garments machines.

8.1 Describe routine maintenance procedure of different industrial sewing machines.
8.2 Describe maintenance system of fabric spreading & cutting machine.
8.3 Describe the repair maintenance, setting, replacing of different parts of rotary knife, straight knife, bent knife, drill mchine & different garments finishing machines.

Practical:

1 Draw the diagram of lock stitch sewing machine and label important parts.
2 Draw the diagram of needle thread tensioning device.
3 Disassemble and assemble the thread tensioning devices.
4 Draw the diagram of bobbin case holder and label its different parts.
5 Disassemble, assemble bbbin case holder.
6 Draw the diagram of stitch density regulatory mechanism.
7 Disassemble and assemble the stitch density regulatory machine.
8 Draw the diagram of straight knife cutting machine & label its important parts.

9 Disassemble and assemble a straight knife cutting machine.
10 Disassemble and assemble a rotary knife.
11 Draw the diagram of a rotary knife and level its important parts.
12 Draw the diagram of a bent knife cutting machine & indicate its important parts.
13 Disassemble and assemble a bent knife cutting machine.
14 Draw the diagram of a fabric drill machine and indicate its important parts.
15 Disassemble and assemble a fabric drill machine.
16 Draw the diagram of a pressing machine and indicate its important parts.
17 Disassemble and assemble a pressing machine
18 Draw the diagram of a fusing machine and indicate its important parts.
19 Disassemble and assemble a fusing machine.
20 Lubricate different point of sewing machine.

4963 TEXTILE TESTING AND QUALITY CONTROL – II

T	P	C
2	3	3

AIMS

To be able to develop knowledge, skill and attitude in the field of textile testing and quality control with special emphasis on:

- yarn evenness and irregularity
- fabric testing, fabric strength and fabric thickness
- crimp and air permeability of fabric
- crease resistance, crease recovery and abrasion resistance
- fabric stiffness, handle and drape
- fabric shrinkage and fastness properties of fabric
- miscellaneous testing instruments and carpet testing.

SHORT DESCRIPTION

Yarn evenness and irregularity; Fabric testing; Fabric strength; Fabric thickness; Crimp; Air permeability of fabric; Crease resistance and crease recovery; Fabric stiffness, handle and drape; Abrasion resistance; Fabric shrinkage; Fastness properties of fabric; Miscellaneous testing instruments; Carpet testing.

DETAIL DESCRIPTION

Theory:

1 Understand the yarn evenness and irregularity with their measurements.

1.1 Define yarn evenness, irregularity and imperfections.
1.2 Mention the types of irregularity.
1.3 Explain the causes of irregularity.
1.4 Describe the effects of irregularity.
1.5 Describe the methods of measuring irregularity.
1.6 Explain the methods of measuring irregularity by electronic capacitance tester.
1.7 Describe fielden walker yarn evenness tester.
1.8 Describe USTER evenness tester.
1.9 Explain normal and inert test of USTE.

2 Understand the fabric testing.

2.1 Explain the importance of fabric testing.
2.2 Mention the names of different types of fabric testing.
2.3 Describe the methods of fabric length measurement.
2.4 Describe the methods of fabric width measurement.
2.5 Describe the methods of fabric weight measurement.

3 Understand the fabric strength and its measurement.

3.1 Mention the importance of fabric strength measurement.
3.2 Describe the methods of fabric strength measurement.
3.3 Define strip test.
3.4 Describe ravelled strip test method.
3.5 Describe cut strip test method.
3.6 Describe drape test method.
3.7 Describe tearning strength test.
3.8 Describe trapezoid test.
3.9 Describe tounge test.
3.10 Describe bursting test.

4 Understand the fabric thickness and its measurement.

4.1 Explain the main principle of fabric thickness measurement.
4.2 Mention the factors considered during thickness measurement.
4.3 Mention the names of fabric thickness measurement instrument.
4.4 Describe heals thickness gauze with its working procedure.

5 Understand the crimp & its measurement.

5.1 Define crimp.
5.2 Mention the effects of crimp.
5.3 Describe the points to be considered during crimp measurement.
5.4 Mention the names of crimp measurement instrument.
5.5 Describe the WIRA crimp meter with its working procedure and precaution.

6 Understand the air permeability of fabric.

6.1 Define air permeability, air resistance and air porosity.
6.2 Describe the principles of air permeability measurement.
6.3 Describe shirley air permeability apparatus.

7 Understand the crease resistance and crease recovery with their measurements.

7.1 Define crease.
7.2 Mention the effects of crease.
7.3 Define crease resistance & crease recovery.
7.4 Mention the names of crease recovery instruments.
7.5 Describe the total crease recovery tests.

8 Understand the fabric stiffness, handle and drape.

8.1 Define fabric stiffness handle & drape.
8.2 Mention the factors influencing fabric stiffness, handle & drape.
8.3 Define bending length, flexible rigidity and bending modules.
8.4 Explain the principles of stiffness measurement.
8.5 Mention the names of stiffness measurement instruments.
8.6 Describe shirley stiffness tester with its basic principles.
8.7 Describe the working procedure of shirley shiftness tester.

9 Understand the abrasion resistance & its measurement.

9.1 Define abrasion resistance, plain or flat abrasion, edge abrasion and flex abrasion.
9.2 Mention the causes of abrasion.
9.3 List the factors considered before abrasion resistance measurement.
9.4 Mention the names of instruments for abrasion resistance measurement.
9.5 Explain abrasion resistance.
9.6 Describe the working principle of martindle abrasion tester.

10 Understand the fabric shrinkage and its measurement.

10.1 Define fabric shrinkage.
10.2 Mention the types of shrinkage.
10.3 Describe the methods of shrinkage measurement.

11 Understand the fastness properties of fabric and its measurement.

11.1 Define fastness.
11.2 Mention the types of fastness property of fabric.
11.3 Describe sample method for fastness test.
11.4 Describe the method of colour fastness test to washing.
11.5 Describe the methods of colour fastness test to perspiration.
11.6 Describe the methods of colour fastness test to light.

12 Understand the use of miscellaneous testing instruments.

12.1 Explain the importance of miscellaneous testing instruments.
12.2 Mention the effects of tension of textiles materials in different production stage.
12.3 Describe the working principle of tension meter.
12.4 Describe stroboscope with main principles and working procedure.
12.5 Define techometer.
12.6 Mention the type of techometer.
12.7 Explain the working procedure of techometer.

13 Understand the carpet testing.

13.1 Discuss the importance of carpet testing. .
13.2 Mention the factors considered during carpet testing.
13.3 Mention the types of carpet testing.
13.4 Describe carpet durability test.
13.5 Describe tetrapod carpet walk testing with working procedure and result recording system.
13.6 Define carpet resilience and carpet thickness.
13.7 Describe WIRA carpet thickness gauze with its working principles.

Practical:

1 Determine the yarn evenness by using different evenness testers.
2 Determine the yarn hairiness by using different yarn hairiness testers.
3 Determine the fabric strength by different fabric strength testers.
4 Determine the fabric thickness by using fabric thickness testing instrument.

5 Determine the fabric air permeability by using shirley air permeability apparatus.
6 Determine the crease resistance & crease recovery of a fabric by crease tester.
7 Determine the fabric drape properties by a fabric tester.
8 Determine the fabric abrasion resistance by using a fabric abrasion tester.
9 Determine the fabric shrinkage after wash with suitable washing machine.
10 Determine the color fastness of a colored fabric.

4964 GARMENTS HUMAN RESOURCE MANAGEMENT

T	P	C
2	0	2

AIMS

- To be able to develop knowledge of model and planning of human resources for garments manufacturing.
- To be able to develop knowledge of human resources management and training.
- To be able to acquire knowledge of motivation and maintenance of human resources.
- To be able to understand the current situation and future position of human resources.
- To be able to gather knowledge of intelligent production scheduling and social aspects of clothing management.

SHORT DESCRIPTION

Human resource management; Model and planning; Morale and morale building; Selection and training; Motivation of human resources; Maintenance of human resources; Bangeades current situation and future position; Intelligent production scheduling; Social and legal aspects of clothing management; Job evaluation and merit rating.

DETAIL DESCRIPTION

Theory:

1 Understand the human resource management (HRM).
- 1.1 Define human resource management.
- 1.2 Mention the function of HRM.
- 1.3 Describe the importance of human management.
- 1.4 Differentiate between HRM and personnel management.

2 Understand model and planning of HRM.
- 2.1 Describe the concept of model and planning of HRM.
- 2.2 List different types of model of HRM.
- 2.3 Describe different types of model planning of HRM.

3 Understand the concept of morale and morale building.
- 3.1 Describe “high morale” and “low morale”.
- 3.2 Explain the methods of measuring morale.
- 3.3 Discuss the factors for promotion of high morale.
- 3.4 Describe the relation between morale and productivity.

4 Understand the selection & training.
- 4.1 Describe job analysis of garments industry.
- 4.2 Describe selection & development of garments people.

4.3 Describe training & career development of garments people.
4.4 Describe training methods of manager development.
4.5 Describe the institutions involved in human development in Bangladesh in garment sector.

5 Understand the motivation of human resources.

5.1 Define motivation.
5.2 Describe different methods of performance appraisal.
5.3 Describe feedback method for improved performance.

6 Understand the maintenance of human resources.

6.1 Describe compensation packages.
6.2 Describe benefits and services impacts on motivations.
6.3 Describe the legal measurement of benefits and services.
6.4 Describe the types of disciplinary problem.
6.5 Describe safety & healthy program.
6.6 Describe the trade policy of Bangladesh government.

7 Understand the Bangladesh current situation and future position.

7.1 Discuss the local clothing industry's current situation and future position.
7.2 Discuss the challenges of major markets and global competitors.
7.3 Describe international sourcing and contracting production.

8 Understand the intelligent production scheduling.

8.1 Describe the criteria and priority setting of clothing sector.
8.2 Describe capacity planning for clothing sector.
8.3 Describe the scheduling tools of garment approach production.
8.4 Describe different software packages used in intelligence scheduling.

9 Understand the social & legal aspects of clothing management.

9.1 Describe industrial and ethical responsibility of employees and employer.
9.2 Describe industrial registration & trade regulations.
9.3 Describe national and international context procedure.

10 Understand the concept of job evaluation and merit rating.

10.1 Explain the terms: task of a employee, job evaluation and job description.
10.2 Describe job specification, personnel specification, merit rating and job analysis.
10.3 Describe the methods of job evaluation.
10.4 Describe the advantages and disadvantages of job evaluation and merit rating.
10.5 Distinguish between job evaluation and merit rating.

		T	P	C
4965	**GARMENTS CAD AND CAM**	**1**	**6**	**3**

AIMS

To be able to develop knowledge, skill and attitude in the field of garments CAD & CAM with special emphasis on:

- CAD software used in garments and fashion industry
- digitizing and computer grading
- fabric cutting and process control by CAD.

SHORT DESCRIPTION

Software and hardware used in garments and fashion industry; Digitizing; Computer grading; Mater making; Automatic fabric cutting and process control by CAD .

DETAIL DESCRIPTION

Theory:

1 Understand the software and hardware used in garments and fashion industry.
- 1.1 Describe different types of CAD softwares used in garments & fashion industry.
- 1.2 Describe different types of CAD hardware.
- 1.3 Describe block creation by CAD software.

2 Understand the digitizing.
- 2.1 Describe digitizing process of creating production pattern.
- 2.2 Describe image creation and manipulation.
- 2.3 Describe different software key functions.

3 Understand the principles of computer grading.
- 3.1 Define grading.
- 3.2 Mention the principle of computer grading.
- 3.3 Describe the preparation of grading by CAD software.

4 Understand the maker making.
- 4.1 Describe the preparation of maker by using CAD.
- 4.2 Describe utilization CAD
- 4.3 Describe the cost of CAD.

5 Understand automatic fabric cutting & process control by CAD.
- 5.1 Describe the basic requirements of fabric cutting.
- 5.2 Mention different soft keys and working procedure of CAD system.
- 5.3 Identify problems of CAD systems.

Practical:

1 Identify the names of machines of CAD & CAM.

2 Switch on & switch off the CAD machine.
3 Develop practical skill to operate F-1 functions.
4 Develop practical skill to operate F-2 functions.
5 Develop practical skill to operate F-3 functions.
6 Develop practical skill to operate F-4 functions.
7 Develop practical skill to operate F-5 functions.
8 Develop practical skill to operate F-6 functions.
9 Develop practical skill to operate F-7 functions.
10 Develop practical skill to operate F-8 functions.
11 Develop practical skill to digitise patterns.
12 Develop practical skill to grade patterns.
13 Develop practical skill to produce marker.
14 Develop practical skill to print out marker.
15 Program & run the fabric spreading machine.
16 Program & run the computerized cutting machine.

4966 GARMENTS IMPORT AND EXPORT MANAGEMENT

T	P	C
2	0	2

AIMS

- To be able to understand the garments export and import management.
- To be able to develop knowledge of export costing and pricing.
- To be able acquire knowledge of garments export and import procedure.
- To be able to understand the export documentation and export marketing communication.

SHORT DESCRIPTION

International trade theory; Export management; Category and quota of different woven garments; Export business environment; Export policy decision of a firm; Export costing and export pricing; Export finance; Export procedure; Export documentation; Export marketing communication; Advantages of garments export; Import procedure.

DETAIL DESCRIPTION

1 Understand the international trade theory.
- 1.1 Describe historical perspective of the theory of comparative cost in classical view.
- 1.2 Describe modern theory of international trade.
- 1.3 Mention the comparison of modern theory with classical theory of international trade.

2 Understand the export management.
- 2.1 Define export management.
- 2.2 Describe export marketing.
- 2.3 Describe procedure of export management.
- 2.4 Describe the scope of export management.
- 2.5 Describe the function of export management.
- 2.6 Mention the problems of export marketing.

3 Understand the category and quota of different woven garments.
- 3.1 Define category and quota.
- 3.2 Mention the category and non-quota category of Canada, USA and EEC country.
- 3.3 Describe the categories of woven garments.
- 3.4 Distinguish between quota and non-quota.

4 Understand the export business environment.
- 4.1 Describe marketing environments around the world.
- 4.2 Describe economic environment.
- 4.3 Describe demographic factors.

4.4 Describe cultural and political environment of export business.
4.5 Describe legal and technological environment of export business.

5 Understand the export policy decision of a firm.

5.1 Describe export policy.
5.2 Mention the factors influencing export business.
5.3 Describe market selection.
5.4 Describe mode of entry.
5.5 Describe legal and technological environment of export business.
5.6 Describe legal and technological environment of export business.

6 Understand export costing and export pricing.

6.1 Define export pricing.
6.2 Mention the objectives of export.
6.3 Describe the importance of export.
6.4 Mention the factors determining export trade.
6.5 Describe the method of costing.
6.6 Describe shipment and types of carriage.
6.7 Describe the insurance and freight cost.
6.8 Describe export and import licensing trade embargoes and restriction.

7 Understand the export finance.

7.1 Describe export finance.
7.2 Describe preshipment finance or packing credit.
7.3 Describe the procedure of obtaining pre shipment credit.
7.4 Describe post shipment finance.
7.5 Describe the procedure for obtaining post shipment finance.
7.6 Discuss monopolies and domination.
7.7 Mention the effects on prices quota and MFA.
7.8 Describe exchange rate in the world markets.

8 Understand the export procedure.

8.1 Describe registration procedure.
8.2 Describe procedure in export trade.
8.3 Describe procedure for realization of export incentives.

9 Understand the export documentation.

9.1 Describe documents required in export transaction.
9.2 Describe different types of export documents.
9.3 Describe the method of obtaining export documents.

10 Understand the export marketing communication.

10.1 Describe export marketing communication.
10.2 Describe export advertising & sales promotion.
10.3 Describe tools of public relation, trade fairs and exhibition.
10.4 Describe the barries in export & marketing communication.

11 Understand the advantages of garments export.

11.1 Elaborate GSP.
11.2 Mention the manes of GSP providing and GSP receiving countries.

11.3 Define cash incentives.
11.4 Mention the requirements to be entitled for cash incentives.
11.5 Describe the procedures to receive cash incentives.

12 Understand the import procedure.

12.1 Describe the procedure of import trade.
12.2 Describe the steps involved in opening letter of credit (L/C) retirement of documents.
12.3 Describe steps involved in clearing goods and back to back L/C.
12.4 Describe the import procedure of garment raw materials, industrial goods and commercial goods.

4967 GARMENTS FINISHING AND QUALITY CONTROL

T	P	C
2	3	3

AIMS

To be able to develop knowledge, skill and attitude in the area of garments finishing and quality control with special emphasis on:

- garments finishing and finishing equipment & method.
- spot removing of garments and quality control.
- inspection of garments industry.

SHORT DESCRIPTION

Garments finishing; Pressing; Faults of finished garments; Folding; Garments finishing equipment and methods; Spot removing of garments; Quality control; Packing; Handling of finished garments; Garments accessories inspection; Quality control in garments section; Final inspection.

DETAIL DESCRIPTION

Theory:

1 Understand the garments finishing.

- 1.1 Define finishing.
- 1.2 Describe different garments finishing (such as stand up, semi stand up, flat pack & hanger pack).
- 1.3 Describe different care label codes.
- 1.4 List the uses of care label code.

2 Understand the pressing.

- 2.1 Define pressing.
- 2.2 Mention the purposes of pressing.
- 2.3 Describe the factors of pressing.
- 2.4 List different equipment of pressing.
- 2.5 Describe the methods of different pressing.

3 Understand the faults of finished garments.

- 3.1 Mention the faults of garments.
- 3.2 Mention the classification of faults.
- 3.3 Describe the garments grading according to faults.
- 3.4 Describe the remedies of garments faults.

4 Understand the folding.

- 4.1 Define folding.
- 4.2 Mention the necessity of folding.
- 4.3 Describe different types of folding.
- 4.4 Mention the faults of folding.

4.5 List the precautions during folding.
4.6 Mention the factors of quality folding.

5 Understand the garments finishing equipment and methods.

5.1 List different finishing equipment of garments.
5.2 Describe the features of electrical & steam iron.
5.3 Describe the uses of electrical & steam iron.
5.4 Describe the working procedure of steam iron.
5.5 Describe working procedure dolly porse machine.
5.6 Describe the importance of steam air finish.
5.7 Describe steam tunnel.

6 Understand the spot removing of garments.

6.1 Describe the importance of spot removing of garments.
6.2 Describe the removing procedure of spot of Grease, Oil and wax, Enamel, Varnish, pitch & Tar sealing wax, Marking Ink, Acid stain, Alkalin stain, Ammenia stains, Tee, Coffes wine, Iron, Coppying link, Writing ink, Grass stain, Dyes blood, Sugar & glue, Milder & lodine.
6.3 Describe the spot removing technique of cotton fabrics.
6.4 Describe the spot removing technique of wool fabrics.
6.5 Describe the spot removing technique of linen fabrics.

7 Understanding the quality control.

7.1 Define quality and standardization.
7.2 Describe the methods of controlling quality.
7.3 Describe the aim of quality control in garments.
7.4 Define inspection.
7.5 Describe inspection loop.
7.6 Mention the objectives of inspection.
7.7 Mention steps of inspection.
7.8 Describe raw material inspection.
7.9 Describe fabric inspection machine.
7.10 Describe four & ten points system of fabric inspection.

8 Understand the packing.

8.1 Define packing.
8.2 Mention the necessity of packing.
8.3 Describe the style of packing.
8.4 Describe the procedure of packing.
8.5 Mention the packing materials and auxiliaries.
8.6 Describe the faults of packing.
8.7 Mention the precaution of packing.

9 Understand the handling of finished garments.

9.1 Define garments handling.
9.2 Mention the importance of safe handling.
9.3 Mention different materials of handling.
9.4 Describe the process of handling.

10 Understand the garments accessories inspection.

10.1 Describe necessity of garments accessories inspection.
10.2 Describe sewing thread inspection.
10.3 Describe sewability tests.
10.4 Describe zipper inspection systems.
10.5 Differentiate among button, velocotape and interlining inspection.

11 Understand the quality control in garments section.

11.1 Describe quality measure in marker making.
11.2 Describe quality measure in fabric spreading.
11.3 Describe quality measure in fabric cutting section.
11.4 Describe quality measure in sewing section.
11.5 Describe ways of removal of sewing defect, seaming defect & assembly defect.
11.6 Describe the quality control of pressing & finishing.

12 Understand the final inspection.

12.1 Describe final inspection.
12.2 Describe in process inspection in a garments industry.
12.3 Describe standard body measurement and tolerence of body measurement.
12.4 Mention inspection points of shirt and trouser.
12.5 Describe the importance of fit and fashion.
12.6 Describe hundred percent inspection.
12.7 Describe spot checking.
12.8 Describe arbitrary and acceptance sampling.
12.9 Describe double sampling plan.
12.10 Describe product quality audit.
12.11 Describe comparability checks.
12.12 Describe different standard commercial fabrics.

Practical:

1 Practice on different types of garment pressing.
2 Practice on garment pressing at different temperature and pressure in the pressing machine.
3 Practice on different types of removing spot using different chemicals & reagents.
4 Practice on different types of garment packing.
5 Practice on finding different types of garments sewing defect and asses the defect by inspection.
6 Practice on different types of sampling.
7 Test sewability of fabric.
8 Practice on sewing thread quality test.
9 Practice on 4-poit fabric inspection system .

1561	BUSINESS COMMUNICATION	T	P	C
		2	0	2

AIMS

- To be able to understand the basic concepts of communication and its process & forms.
- To be able to perform the information handling.
- to be able to perform in writing application for job, letter and forms of correspondences

SHORT DESCRIPTION

Basic concepts of communication; Communication model & feedback; Types of communication; Methods of communication; Formal & informal communication; Essentials of communication; Report writing; Technical report; Information handling; Office management; Communication through correspondence; Official and semi-official letters.

DETAIL DESCRIPTION

1 Understand the basic concepts of communication and its process & scope.
- 1.1 Define communication.
- 1.2 Define business communication.
- 1.3 Describe the scope of business communication.
- 1.4 State the objectives of business communication.
- 1.5 Discuss the essential elements of communication process.

2 Understand the communication model and feedback.
- 2.1 Define communication model.
- 2.2 State the business functions of communication model.
- 2.3 Define feedback.
- 2.4 State the basic principles of effective feedback.
- 2.5 Explain the essential feedback to complete communication process.

3 Understand the types of communication.
- 3.1 Explain the different types of communication.
- 3.2 Describe the advantages and disadvantages of upward communication.
- 3.3 Describe the advantages and disadvantages of downword communication.
- 3.4 Distinguish between upward and downword communication.
- 3.5 Define two-way communication.
- 3.6 Describe the advantages and disadvantages of two-way communication.

4 Understand the methods of communication.

4.1 Define communication method.
4.2 Discuss the various methods of communication.
4.3 Describe the advantages and disadvantages of oral communication.
4.4 Describe the advantages and disadvantages of written communication.
4.5 Distinguish between oral and written communication.

5 Understand the formal and informal communication.

5.1 Define formal communication.
5.2 Describe the advantages and disadvantages of formal communication.
5.3 Define informal communication.
5.4 Discuss the advantages and disadvantages of informal communication.
5.5 Distinguish between formal and informal communication.

6 Understand the essentials of communication.

6.1 Describe the essential features of good communication.
6.2 Describe the barriers of communication.
6.3 Discuss the means for overcoming barriers to good communication.

7 Understand the report writing.

7.1 Define report.
7.2 Define business report.
7.3 State the essential qualities of a good report.
7.4 Describe the factors to be considered while drafting a report.
7.5 Explain the components of a report.
7.6 Describe the classification of report.

8 Understand the technical report.

8.1 Define technical report.
8.2 Mention the uses of technical report.
8.3 Describe the types of technical report.
8.4 Distinguish between a technical report and general report.

9 Understanding the information handling.

9.1 Define data, facts and events.
9.2 State the sources of information.
9.3 Describe the channel of communication relevant to information.
9.4 Define management information systems (MIS).
9.5 Discuss the channel of presentation of data in the report.

10 Understand the office management.

10.1 Define office and office work.
10.2 State the characteristics of office work.
10.3 Define filing and indexing.
10.4 Discuss the methods of filing.
10.5 Discuss the methods of indexing.
10.6 Distinguish between filing and indexing.

11 Understand communication through correspondence.

11.1 State the types of correspondence.

11.2 Define commercial letter.
11.3 Mention the objects of commercial letter.
11.4 State the different parts of a commercial letter.
11.5 Distinguish between commercial letter and personal letter.

12 Understand the official and semi-official letters.

12.1 Define official letter and semi-official letter.
12.2 Distinguish between official letter and semi-official letters.
12.3 Prepare the following letters :
interview letter, appointment letter, joining letter and application for employment.
12.4 Prepare the complain letters.
12.5 Draft a tender notice to be published in a daily newspaper.

1562 INDUSTRIAL MANAGEMENT – I **T P C**
2 0 2

AIMS

- To be able to develop the working condition in the field of industrial or other organization.
- To be able to understand develop the labor management relation in the industrial sector.

SHORT DESCRIPTION

Basic concepts of management; Principles of management; Scientific management; Organization; Span of supervision; Motivation; Personnel management and human relation; Staffing and manpower development; Training of staff; Job evaluation and merit rating; Industrial dispute; Budget & budgetary control; Concept of leadership.

DETAL DESCRIPTION

1 Understand the basic concepts & principles of management.
- 1.1 Define management and industrial management.
- 1.2 State the objectives of modern management.
- 1.3 Describe the scope and functions of management.
- 1.4 State the principles of management.
- 1.5 Discuss the terms : administration, organization, management.
- 1.6 State the activity level of industrial management from top personnel to workmen.
- 1.7 Describe the reaction among administration, organization & management.
- 1.8 Explain the social responsibilities of management.

2 Understand the concept of scientific management.
- 2.1 Define scientific management.
- 2.2 Discuss the basic principles of scientific management.
- 2.3 Explain the different aspects of scientific management.
- 2.4 Discuss the advantages and disadvantages of scientific management.
- 2.5 Describe the difference between scientific management and traditional management.
- 2.6 Describe the following four periods of management thought:
  - (i) pre-scientific management.
  - (ii) scientific management.
  - (iii) human relations
  - (iv) refinement extension and synthesis of management theories and practices.

3 Understand the concepts of organization and organization structure.

3.1 Define management organization.
3.2 State the elements of management organization.
3.3 Discuss the types of organization structure
3.4 Describe different forms of organization structure.
3.5 Distinguish between line organization and line & staff organization.
3.6 Distinguish between line organization and functional organization.
3.7 Describe the feature advantages and disadvantages of each organization.
3.8 Define organizational chart.
3.9 Describe the different types of organizational chart.

4 Understand the basic concept of span of supervision.

4.1 Define span of supervision and optimum span of supervision.
4.2 Discuss the considering factors of optimum span of supervision.
4.3 Discuss advantages and disadvantages of optimum span of supervision.
4.4 Define delegation of authority.
4.5 Explain the principles of delegation of authority.
4.6 Explain the terms: authority, responsibility and duties.

5 Understand the concept of motivation.

5.1 Define motivation.
5.2 Discuss the importance of motivation.
5.3 Describe financial and non-financial factors of motivation.
5.4 State the motivation process or cycle.
5.5 Discuss the motivation theory of Maslows and Harzbergs.
5.6 Differentiate between theory-X and theory-Y.
5.7 Discuss the relation between motivation and morale.

6 Understand the concept of personnel management and human relation.

6.1 Define personnel management.
6.2 Describe the scope of personnel management.
6.3 Discuss the importance of personnel management.
6.4 Discuss the functions of personnel management.
6.5 Discuss the disadvantages of personnel management in Bangladesh.
6.6 Describe the way of solving problems of personnel management in Bangladesh.

7 Understand the staffing and manpower development.

7.1 Define staffing.
7.2 Discuss the importance and necessity of staffing.
7.3 Define recruitment and selection of employees.
7.4 Describe various sources of recruitment of employees.
7.5 Describe the various methods of selection of employees.
7.6 Discuss the advantages and disadvantages of internal sources of recruitment.
7.7 Discuss the disadvantages of external sources of recruitment.
7.8 Define manpower planning.

7.9 Describe advantages and disadvantage of manpower planning.

8 Understand the need for training of staff.

8.1 Define training and orientation of employee.
8.2 Discuss the importance and necessity of training.
8.3 Describe the process of training.
8.4 Discuss the various methods of training of workmen, technicians and executive personnel.
8.5 Explain the benefits of training in business and industrial concerns.

9 Understand the concept of job evaluation and merit rating.

9.1 Explain the terms : Task of a employee, Job evaluation, Job description, Job specification, Personnel specification, Merit rating, Job analysis
9.2 Describe the methods of job evaluation and merit rating.
9.3 Discuss the advantages and disadvantages of job evaluation and merit rating.
9.4 Distinguish between job evaluation and merit rating.

10 Understand the concept of industrial dispute.

10.1 Define industrial dispute.
10.2 Discuss the elements of industrial dispute.
10.3 Describe the causes of industrial dispute.
10.4 Discuss the modes of dispute settlement in Bangladesh.
10.5 Explain the terms:
- Strike.
- Lock-out
- Picketing
- Gherao
- Go slow.

11 Understand the concepts of budget and budgetary control.

11.1 Define budget and budgetary control
11.2 Describe the different types of budget.
11.3 Discuss the objectives of budget.
11.4 Discuss the advantages and disadvantages of budgetary control.
11.5 State the pre-requisites for successful budgetary control.

12 Understand the concept of leadership.

12.1 Define leadership.
12.2 Discuss the importance and necessity of leadership.
12.3 Discuss the functions of leadership.
12.4 Identify the types of leadership.
12.5 Describe the qualities of a leader.
12.6 Distinguish between autocratic leader and democratic leader.