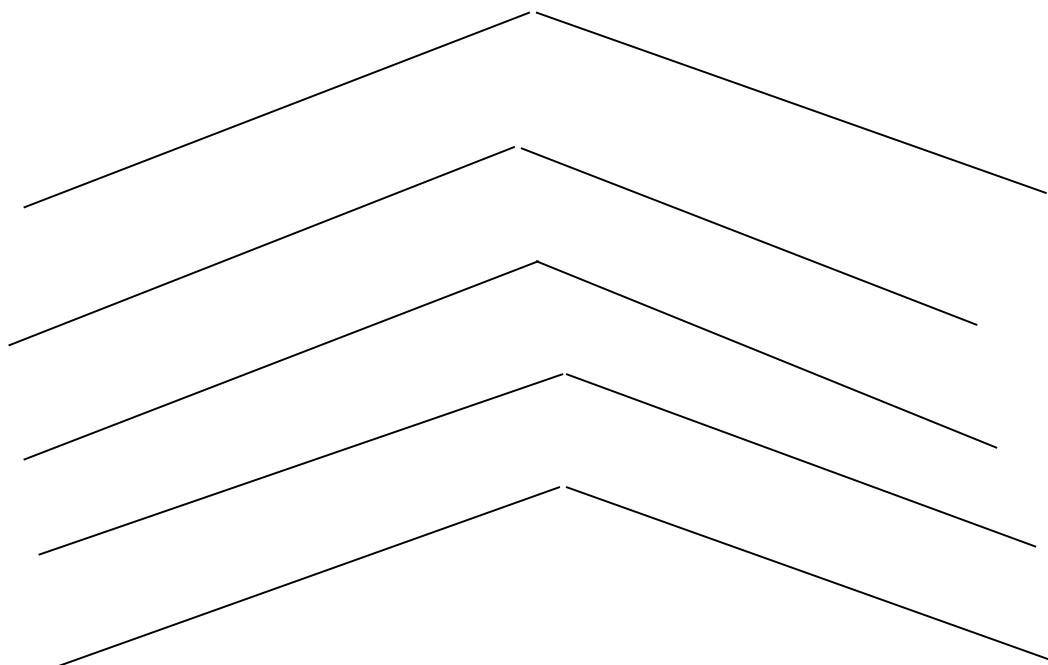**BANGLADESH TECHNICAL EDUCATION BOARD**

4- YEAR

DIPLOMA-IN-TEXTILE ENGINEERING PROGRAM

SYLLABUS

4TH SEMESTER

BANGLADESH TECHNICAL EDUCATION BOARD

4-YEAR

DIPLOMA IN TEXTILE ENGINEERING PROGRAM

SYLLABUS

FOURTH SEMESTER

Textile Technology

FOURTH SEMESTER

Sl No	Subj. code	Name of the subject	T	P	C	MARKS				
						Theory		Practical		Total
						Cont. assess.	Final exam.	Cont. assess.	Final exam.	
1	1941	Yarn Manufacturing-II	3	3	4	30	120	25	25	200
2	1942	Fabric Manufacturing-II	3	3	4	30	120	25	25	200
3	1943	Wet Processing-I	3	3	4	30	120	25	25	200
4	1944	Textile Testing & Quality Control-I	3	3	4	30	120	25	25	200
5	2149	Statistic	2	0	2	20	80	-	-	100
6	6632	Computer Application-II	0	6	2	-	-	50	50	100
7	5840	Environmental Management	2	0	2	20	80	-	-	100
		TOTAL	**16**	**18**	**22**	**160**	**640**	**150**	**150**	**1100**

1941   **YARN MANUFACTURING-II**   **T   P   C**

                                                             3   3   4

AIMS

      To provide the students with an opportunity to acquire knowledge and skills in the area of yarn manufacturing with special emphasis on:

●   Cotton drawing frame and their process.

●   Combing machine and their process.

SHORT DESCRIPTION

Understanding basic aspects of basic cotton drawing frame, draft setting and draft calculation of drawing frame, combing and comb setting and also their process.

DETAILED DESCRIPTION

<u>**Theory:**</u>

1.0   Understand the Drawing Frame.
    1.1   Define drawing.
    1.2   Mention the purpose of drawing frame.
    1.3   State the functions of drawing frame.
    1.4   Mention the main parts of drawing frame
    1.5   Discuss the features of ordinary draw frame
    1.6   Discuss the features of modern draw frame
    1.7   Describe the processes of drawing.

2.0   Understand Drafting & Doubling.
    2.1   State the term, draft, drafting & doubling.
    2.2   Mention the types of draft.
    2.3   Describe the types of draft
    2.4   Discuss the relationship between draft and doubling.
    2.5   Mention the draft distribution of drawing frame.
    2.6   Discuss different drafting system.
    2.7   State roller slip.
    2.8   Discuss drafting wave.
    2.9   Mention the amount of draft and doubling available in drawing frame.

3.0   Understand the Drafting zone and Roller setting.
    3.1   Discuss about drafting zone.
    3.2   Mention the types of rollers used in drafting zone.
    3.3   State the functions of top & bottom rollers in drafting zone
    3.4   Discuss the roller weighting (pressure) system in draw frame.

3.5   Mention roller settings.

3.6   Describe the factors considered for roller setting.

3.7   Describe the effect of roller setting on drawn sliver.

3.8   Discuss the roller clearer

4.0   Understand the stop motion & auto leveler of drawing.

4.1   State the term stop motion of drawing frame.

4.2   Mention the purposes of stop motions.

4.3   Mention the types of stop motions.

4.4   Define "auto leveler".

4.5   Discuss the functions of "auto leveler".

4.6   Mention the types of "auto leveler".

5.0   Understand wastages & faults of draw frame.

5.1   Define wastages.

5.2   State wastages produced in draw frame.

5.3   Mention the amount wastage produced in draw frame.

5.4   Discuss the factors for wastages control in draw frame.

5.5   Discuss the faults occurred in draw frame.

5.6   Discuss the causes & remedies of draw frame faults.

6.0   Understand calculation of draw frame.

6.1   State speed of draw frame.

6.2   State surface speed of rollers in draw frame.

6.3   Discuss the formulae of draft.

6.4   Discuss the formulae of production calculation of draw frame.

6.5   Mention the change points of draw frame and their effects on changing.

7.0   Understand combing

7.1   Define combing.

7.2   State the objects and importance of combing.

7.3   State the degree of combing and classify them.

7.4   State the parameters influencing the combing operation.

7.5   Describe combing cycle.

8.0   Understand preparation for combing.

8.1   State the necessities of lap preparation before combing.

8.2   State the importance of number of passages used before combing.

8.3   Discuss about different lap preparation machine.

8.4   Describe lap preparation processes.

9.0   Understand combing machine.

9.1   State the task of a comber.

9.2   Mention the types of comber.

9.3   Describe different assembly & working parts of a comber.

    9.4   Describe working principle of a comber.

    9.5   Discuss about index wheel.

    9.6   State about draw box.

    9.7   Discuss comber settings.

10.0   Understand wastages & faults of comber.

    10.1   Name the wastages produced in comber.

    10.2   Discuss the factors for wastages control in comber.

    10.3   Discuss the faults occurred in comber.

    10.4   Discuss the causes & remedies of comber faults.

    10.5   State the characteristics of combed yarn.

11.0   Understand calculation of lap former & comber.

    11.1   State the speed of comber & lap former.

    11.2   State the amount of draft of comber & lap former.

    11.3   Discuss the formulae for production calculation of comber & lap former.

    11.4   Mention the formulae for draft calculation of comber in draw box.

    11.5   Mention the change points of comber & their effects on changing.

Practical:

Perform practical work in your cotton spinning shed and write the description of machines, their parts with functions.

1.0   Cotton drawing frame; doubling & drafting system; draft calculation; study of auto stop motion; roller setting.

2.0   show the sliver passage through lap machine mentioning the component parts & their functions:

3.0   Show the working principle of a comber mentioning the name of its component parts.

4.0   Examine the combing cycle in accordance with index wheel.

Reference books:

1.0   A practical guide to opening and carding- w. Klein.

2.0   Manual of cotton spinning vol. i part i & part ii- textile institute.

3.0   Textile fibre to fabric –Bernard p. cabman

4.0   Cotton spinning-w.s taggert.

5.0   Cotton spinning hand book - R. jagannathan.

6.0   Textile mill technical data – R. Jagannathan.

7.0   ইয়ার্ন ম্যানুফ্যাকচারিং-১ মোঃ মহিবুল ইসলাম.

8.0   আঁশ থেকে সুতা-আলী আহমেদ চৌধুরী।

1942   **FABRIC MANUFACTURING-II**

AIMS

T P C
3 3 4

●   To develop the basic knowledge regarding weaving & knitting.
●   To develop the basic knowledge about shed & shedding mechanism.
●   To familiarized the student with different motions of loom & knitting action.

SHORT DESCRIPTION:

Shed; Shedding mechanism; Tappet; Top roller mounting; Picking; Beating up; Take up motion, Let off motion & basic idea of knitting.

DETAILED DESCRIPTION

Theory:

1.0 Understand the shed.
    1.1   Define shed.
    1.2   Classify the shed.
    1.3   Illustrate the method of formation of different sheds.
    1.4   Mention the advantages & disadvantages of different types of sheds.

2.0 Understand in shedding mechanism.
    2.1   Define shedding mechanism.
    2.2   Classify method of shedding.
    2.3   Define tappet and tappet shedding.
    2.4   List different types of tappet.

3.0 Understand tappet shedding mechanism.
    3.1   Discuss the mechanism of tappet shedding.
    3.2   Explain the lift of tappet, depth of the shed and dwell of tappet.
    3.3   Discuss the points to be considered for tappet construction.
    3.4   Describe the construction of plain tappet.
    3.5   Describe the construction of twill tappet.
    3.6   Mention the advantages and disadvantages of tappet shedding.

4.0 Understand tappet driving
    4.1   State bottom shaft.
    4.2   State counter shaft.
    4.3   Discuss the function of counter shaft.
    4.4   Illustrate the driving of bottom & counter shaft.

4.5   Calculate the ration of crank shaft, bottom shaft & counter shaft, R.P.M for different number of shedding tappet.

5.0   Understand mounting of tappet & top roller.
  5.1   Define mounting of tappet.
  5.2   Define mounting of top roller.
  5.3   Discuss the mounting of tappet on bottom shaft & counter shaft.
  5.4   Discuss the heald shaft reversing motion.
  5.5   Discuss the mounting of top roller for different number of heald shaft.
  5.6   Relevant calculation of tappet driving & top roller mounting.

6.0   Understand the picking motion.
  6.1   Define picking.
  6.2   Classify the picking mechanism.
  6.3   Define over picking & under picking.
  6.4   Illustrate the working principle of over picking.
  6.5   Illustrate the working principle of under picking.
  6.6   Distinguish between over picking and under picking.

7.0   Understand the beating up.
  7.1   Define beating up.
  7.2   Mention the objects of beating up.
  7.3   Describe the crank and crank arm beating-up mechanism.
  7.4   Define sley eccentricity.
  7.5   Define reed count & heald count.
  7.6   Classify reed count.
  7.7   Calculation requrding reed count & heald count.

8.0   Understand the hand knitting.
  8.1   Define hand knitting.
  8.2   Classify the hand knitting.
  8.3   Describe the types of hand knitting.
  8.4   Describe hand driving socks machine.
  8.5   Describe the construction & working principle of sweaters machine.
  8.6   Describe hand driving mufler machine.
  8.7   Define the terms loop, loop length, course, wales, open loop, close loop, needle, sinker, cam, stitch, plain stitch, back stitch, stitch density.

9.0   Understand the power knitting.
  9.1   Define power knitting machine.

9.2   Classify knitting machine.

9.3   Describe fabric machine.

9.4   Describe garments length machine.

9.5   Describe single jersey circular knitting machine.

10.0   Understand knitting action.

10.1   Describe single jersey circular knitting action.

10.2   Classify sinker & cam.

10.3   Describe the function of sinker & cam.

10.4   Define needle gauge.

10.5   Distinguish between single jersey & double jersey circular knitting machine.

10.6   Calculation of circular knitting machine.

Practical

1.   Draw a handloom and show the yarn path through the loom.
2.   Draw and leveling different parts of loom.
3.   Draw and find-out the count of supplied reed & heald.
4.   Draw plain tappet & twill tappet.
5.   Practice socks machine operation.
6.   Practice sweater machine operation.
7.   Practice mafler machine operation.
8.   Draw & identify different needles.
9.   Practice the single jersey circular knitting action with latch needle.
10.   Draw the circular knitting action of mufler machine.

References and bibliographic

1. Knitting Technology – Terry brackenbury.
2. Fabric manufacturing-2 – Md. Abdul khalique

1943 **WET PROCESSING-I** **T   P   C**

                                                        3   3   4

AIMS

      To provide the students with an opportunity to acquire knowledge and skills in the area of wet processing with special emphasis on.

●   Water
●   Alkali and salt
●   Acidity and alkalinity
●   Oxidation and reduction
●   Soap and detergent.
●   Brushing, shearing/cropping & singeing.
●   Desizing

SHORT DESCRIPTION

      Textile chemistry/wet processing; Water; Water treatment; Acids; Alkali and salt; Acidity & alkalinity; Oxidation & reduction; Oxidizing & reducing agent; Soap & detergent; Brushing & shearing/desizing, Singeing.

DETAILED DESCRIPTION:

THEORY:

1.0   Understand basic aspect of Textile chemistry/wet processing

    1.1   Concept about the wet processing.

    1.2   Discuss the importance of Textile wet processing.

    1.3   Describe the flow-chart of wet processing.

2.0   Understand water & water treatment.

    2.1   State the types of water.

    2.2   Describe the importance of water quality in wet processing.

    2.3   Distinguish between soft water and hard water.

    2.4   Explain the problem of hard water in wet processing.

    2.5   Describe the water quality for wet processing industry.

    2.6   Describe the lime and soda process.

    2.7   Describe the base or action exchange process.

    2.8   State methods of expressing hardness.

    2.9   Describe the process of estimating hardness of water.

3.0   Understand the basic idea of acids.

    3.1   Define acid.

    3.2   Describe the properties of acids.

3.3   Mention the uses of various acids in wet process.

3.4   Define acidity

3.5   Describe the measurement of acidity.

4.0   Understand the basic idea of alkali.

4.1   Define alkali.

4.2   Describe the properties of alkali.

4.3   Mention the uses of various alkalis in wet processing.

4.4   Mention strong and weak alkali.

4.5   Describe the Measurement of alkalinity.

4.6   Explain the P^H of a solution.

4.7   Mention the importance of P^H for water.

4.8   Describe the process of P^H determination.

5.0   Understand the basic idea of salts.

5.1   Define salt

5.2   Describe the properties of salt.

5.3   Mention the uses of various salts in wet process.

6.0   Understand the basic concepts of oxidizing and reducing agent

6.1   Define oxidizing and reducing agent.

6.2   Mention functions with example of oxidizing & reducing agent.

6.3   Mention the uses of oxidizing and reducing agent in-wet processing.

7.0   Understand the basic concepts of soap & detergents.

7.1   Define soap, saponification & detergents.

7.2   Explain the importance of soap & detergents.

7.3   Describe the properties of soap & detergents.

7.4   Describe the process of saponification.

7.5   Distinguish between soap & detergent.

7.6   Mention the uses of various detergents in wet process.

8.0   Understand the brushing & shearing.

8.1   Define brushing & shearing.

8.2   Discuss the necessity of brushing & shearing.

8.3   Describe the process of brushing & shearing.

9.0   Understand the singeing

9.1   Define singeing.

9.2   Explain the necessity of singeing.

9.3   State the types of singeing process.

9.4   Describe the process of gas singeing.

9.5   Describe the process of plate singeing.

9.6   Mention the advantages of gas singeing.

10.0   Understand the de-sizing.

10.1   Define de-sizing.

10.2   Explain the necessity of de-sizing.

10.3   Mention the types of de-sizing.

10.4   Mention recipe of de-sizing.

10.5   Describe the different processes of de-sizing.

10.6   Define enzyme

10.7   Advantages of enzyme de-sizing.

10.8   Mention characteristics of enzyme.

10.9   State classification & function of enzyme according to source.

PRACTICAL:

1.0   Determine the hardness of water.

2.0   Determine the P^H of water.

3.0   Practice to remove the hardness of water.

4.0   Prepare cotton fabric for dyeing & printing by singeing process.

5.0   Measure the acidity of a solution.

6.0   Measure the alkalinity of a solution.

7.0   Treat some sample fabric with alkali.

8.0   Treat the fabrics by detergent.

9.0   Treat the fabrics by soap.

10.0   Prepare cotton fabric by enzyme desizing.

REFERENCE AND BIBLIOGRAPHIC

1.   Technology of Textile Processing - Dr. V. A. Shenai Vloume-Iii.

2.   An Introduction to Textile Bleaching- J. T. Marsh.

3.   Textile Chemistry-1- Md. Mozibur Rahaman.

1944   **TEXTILE TESTING & QUALITY CONTROL -I**   **T   P   C**
                                                                3   3   4

AIMS:
　　　　To provide the students with an opportunity to acquire knowledge & skill about Testing, Techniques & System of Testing. Operating system of different modern Testing instruments, Interpretation & Analysis of testing data uses & Maintenance of testing instruments.

SHORT DESCRIPTION:
　　　　Basic aspects of textile testing, humidity, moisture in textiles, sampling, identification of textile fibers, fiber length & its measurement, fiber strength & its measurement, Trash, neps & their measurement, fiber fineness & its measurement, micronaire value, fiber maturity.

DETAIL DESCRIPTION:
THEORY
1.0   Understand the Basic aspect of textile testing.
　　　1.1   Illustrate the importance of textile testing.
　　　1.2   Mention the objects of textile testing.
　　　1.3   State the factors affecting test results.
　　　1.4   List the name of tests for fiber, yarn & fabric.

2.0   Understand Humidity & its measurement.
　　　2.1   Define humidity, relative humidity, absolute humidity, standard atmosphere, testing atmosphere, conditioning.
　　　2.2   Discuss the effect of humidity on textile.
　　　2.3   Describe the working principles of humidity measuring instrument, such as wet & dry bulb hygrometer.
　　　2.4   Discuss different machines used to measure the humidity of textile materials by drying oven, moisture meter.

3.0   Understand moisture in textile.
　　　3.1   Define moisture content, moisture regain, absorption, desorption, hysteresis effect.
　　　3.2   Mention the MC & MR of some important textile fibers (natural & man-made).
　　　3.3   State the factors affecting regain of textile materials.

4.0   Understand Sampling.
　　　4.1   State the necessity of sampling.
　　　4.2   Describe the factors influencing sampling method.
　　　4.3   Discuss different fiber sampling method.
　　　4.4   Describe sampling scheme for HVI & AFIS testing.

5.0   Understand Identification of textile fiber.
　　　5.1   Explain the necessity of fiber identification.
　　　5.2   State the methods of sample preparation for identification.
　　　5.3   Describe different identification process for fiber.

6.0   Understand fiber length & its measurement.
　　　6.1   State the importance of fibre length.

6.2   Define the term: Staple length, effective length, mean length, modal length, spun length, floating fiber percentage, uniformity ratio.

6.3   Describe the methods of fiber length measurement by conventional & modern instruments, such as comb sorter, digital fibro graph, HVI, AFIS.

7.0   Understand fiber strength & its measurement.

7.1   State the importance of fiber strength.

7.2   Mention the factors influencing fiber strength.

7.3   Describe the methods of fiber strength measurement by pressley fiber bundle strength tester & stelometer.

8.0   Understand Trash, Neps & Their measurement.

8.1   Define trash & Neps.

8.2   Discus the necessity of trash & neps measurement.

9.0   Understand linear density or fiber fineness.

9.1   Define fiber linear density.

9.2   Discuss the importance of fiber fineness measurement.

9.3   Describe different methods & instruments for fiber fineness measurement.

10.0   Understand Micronaire value & fiber maturity.

10.1   State micronaire value & fiber maturity.

10.2   Explain the importance of micronaire value & fiber maturity.

10.3   Classify cotton fiber according to mic value.

10.4   Discuss the maturity measurement method.

PRACTICAL

Perform the following tests in laboratory with suitable instrument describing objects of the experiment, sampling procedure, machine detail, working principle, test procedure, interpretation of result, precautions to be taken with elaborate sketch of the machine or system:

1.   Humidity measurement by wet & dry bulb hygrometer.
2.   Measurement of humidity of textile material by drying oven.
3.   Fiber identification by (1) Microscopic test (ii) Burning test (iii) Chemical test
4.   Fiber length measurement by (i) Comb-sooter (ii) Digital fibrograph (iii) HIV (iv) AFIS
5.   Fiber strength measurement by (i) Pressley bundle strength tester & (ii) Stelometer.
6.   Fiber fineness measurement by WIRA cotton fineness meter.
7.   Trash content measurement by Shirley Trash Analyzer.

REFERENCE BOOK

1.   Textile Testing – J.E. booth.
2.   Textile Testing-R. Gopalakrysnan.
3.   Manual for Textile Testing- sitra.
৪.   টেস্টিং অব টেক্সটাইল-আ. ক. ম ফরিদুল আজাদ
৫.   টেক্সটাইল টেস্টিং- ইঞ্জিনিয়ার মোঃ মজিবুর রহমান।

2149	**STATISTICS**	**T**	**P**	**C**
		2	**0**	**2**

AIMS

- To be able to understand the basic concepts and principles of statistics.
- To be able to use the knowledge of data collection and presentation of data.
- To be able to use the knowledge of different graphical representation and central tendency.
- To use the knowledge of measures of dispersion; distribution and sampling to solve the different problems.

SHORT DESCRIPTION

basic concepts of statistics; data collection; presentation of data; graphical representation ; central-tendency; measures of dispersion ; distribution ; sampling; correlation; regression; time series .

DETAILED DESCRIPTION

Theory:

1.0   Understand the basic concept of statistics.

1.1   Define statistics.
1.2   Describe the characteristics of statistics.
1.3   Describe the functions of statistics.
1.4   Mention the importance of statistics.
1.5   Describe the role of statistics in textile industry.
1.6   Mention the limitation of statistics.
1.7   Discuss statistics methods.
1.8   Describe the uses of statistics.

2.0   Understand the data collection.

2.1   define data and data collection
2.2   Classify o data according to source.
2.3   State the methods of collection of primary data.
2.4   State the methods of collection of secondary data.
2.5   Distinguish between primary and secondary data.

3. 0   understand the classification

3.1 Define classification.
3.2 State the objectives of classification.
3.3 Mention the factors of classification.
3.4 Describe the types of classification.

4.0   understand tabulation

    4.1   Define statistical tabulation.

    4.2   State the methods of tabulation.

    4.3   Discuss the importance of tabulation.

    4.4   Mention the uses of statistical table.

5.0   understand the presentation of data.

    5.1   Define presentation of data.

    5.2   classify presentation of data

    5.3   Describe the procedure of data presentation.

6.0   understand the attribute and variable.

    6.1   Define attribute and variable.

    5.1   Classify variable.

    5.2   Distinguish between attribute and variable.

    5.3   Distinguish between discrete and continuous variable.

    5.4   Distinguish between variable and constant.

6.0   understand the frequency distribution.

    61   Define frequency distribution.

    62   Describe the types of frequency distribution.

    63   Mention grouped frequency distribution.

    64   Mention ungrouped frequency distribution.

    65   Distinguish between grouped and ungrouped frequency distribution.

7.0   understand the graphical representation.

    7.1   Define graphical representation.

    7.2   Mention the types of graphical representation.

    7.3   State the importance of graphic presenting data.

    7.4   Mention the limitation of diagrams and graphs.

8.0   understand the histogram.

    8.1   Define histogram.

    8.2   State the importance of histogram.

    8.3   Describe the uses of histogram.

    8.4   Mention the formula of histogram.

    8.5   solve the problems related histogram

9.0 understand the frequency polygon.

    9.1   Define frequency polygon.

    9.2   State the importance of frequency polygon.

    9.3   Distinguish between histogram and frequency polygon.

    9.4   Solve the problems of frequency polygon.

10.0 understand the pie chart

    10.1   define pie chart.

    10.2   state the importance of pie chart

    10.3   prepare the pie chart.

    10.4   solve the problems of pie chart.

11.0 understand the arithmetic mean.

    8.1   Define arithmetic mean.

    8.2   Classify the arithmetic mean.

    8.3   Mention the properties of arithmetic mean.

    8.4   Calculate the simple arithmetic mean for grouped data.

    8.5   Calculate the arithmetic mean for ungrouped data.

    8.6   Calculate the a. m of unequal frequency distribution.

    8.7   State the weight arithmetic mean.

    8.8   Discuss the advantage and disadvantage of arithmetic mean.

    8.9   Discuss the uses of arithmetic mean.

12.0 understand the geometric mean.

    12.1   Define geometric mean.

    12.2   Mention the advantage and disadvantage of geometric mean.

    12.3   State the uses of geometric mean.

    12.4   proof the gm $\leq$ h. m and g.m $= \sqrt{a . m \times h\, m}$

    12.5   solve the problems of geometric mean.

13.0 understand the harmonic mean.

    13.1   Define harmonic mean.

    13.2   Mention the advantage and disadvantage of harmonic mean.

    13.3   State the uses of harmonic mean.

    13.4   Proof the a m $>$ g m $>$ h m

    13.5   solve the problems of harmonic mean.

14.0   understand the median

    14.1   Define the median.

    14.2   Mention the advantage and disadvantage of median.

    14.3   Mention the uses of median.

    14.4   State the formulae of median.

    14.5   Solve the problems of median for group data.

15.0   understand the mode

    15.1   Define the mode.

    15.2   Explain the relation between mean, median and mode.

    15.3   Mention the advantage and disadvantage of mode.

    15.4   Mention the uses of mode.

    15.5   State the formula for mode.

    15.6   Solve the problems of mode.

    15.7   Distinguish between median and mode.

16.0   understand of dispersion.

    16.1   Define dispersion.

    16.2   Classify the dispersion.

    16.3   Discuss the relative measures of dispersion.

    16.4   Explain the absolute measurement of dispersion.

    16.5   Distinguish between dispersion and range.

    16.6   Solve the problems of dispersion.

17.0   understand the range.

    17.1   Define range.

    17.2   Computation of range.

    17.3   List the advantages and disadvantages of range.

    17.4   Mention the uses of range.

    17.5   Solve the problems of range.

18.0   understand the variance and standard deviation

    18.1   Define variance and standard deviation.

    18.2   Computation of standard deviation.

    18.3   State the co-efficient of variation.

    18.4   Mention the advantages and disadvantages of standard deviation.

    18.5   Mention the uses of standard deviation and variance.

    18.6   Distinguish between mean deviation and standard deviation.

    18.7   State the quartile deviation.

    18.8   Solve the problems of standard deviation and variance.

19.0 understand the correlation

19.1 Define correlation.

19.2 Classify the correlation.

19.3 State the co-efficient of correlation.

19.4 Discuss the correlation origin.

19.5 Proof that $-1 < r < 1$ for correlation.

19.5 Solve the problems of correlation.

20.0 understand the regression

20.1 Define regression.

20.2 State the regression equation.

20.3 State the difference between correlation and regression.

20.4 Deduct regression equation of y on x.

20.5 Deduct regression equation of x on y.

Reference books :

১) পরিসংখ্যান পরিচিতি   -----------   মিয়া এবং মিয়ান

২) উচ্চ মাধ্যমিক পরিসংখ্যান   ---------   আবুল কালাম আজাদ

৩) বানিজ্যিক পরিসংখ্যান   --------   অধ্যাপশ এম , এইচ , আকন্দ

8) Method of statistics   -------- Shukla and Gulshan

6632   **Computer Application -II**   **T   P   C**
                                                                          0   6   2

OBJECTIVES

        To develop skill on spreadsheet applications.
        To develop skill on creating graphs.
        To assist in the efficient use of database packages.
        To develop skill on computerized database management.
        To develop skill on programming with database management.

SHORT DESCRIPTION

Spreadsheet Analysis Package: Applications of spreadsheet; Using worksheet; Apply formula and functions in worksheet; Creating & printing graphs; Create simple macros.

Database management package: Creating the database; Editing the database; Searching the records; Customizing the data entry form; Creating the query; Arranging the records; Generating reports.

Database management language: Creating a command file; Writing simple database program using decision-making commands; Designing data entry screen.

DETAIL DESCRIPTION

SPREAD SHEET ANALYSIS PACKAGE:

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, and status indicator) of the worksheet screen.
        1.3   Identify the function of different keys (typing key, calculator key, text key, cursor 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 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 worksheet.
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.

4   **Apply formulae, function and using templates.**
4.1   Use simple formulae to solve arithmetical computation.
4.2   Use arithmetical operators in formulae and logical formula.
4.3   Edit formulae
4.4   Use mathematical function to solve simple equations.
4.5   Change the evaluation order.
4.6   Control the worksheet calculation.
4.7   Open new files based on.
4.8   Make and use workbook templates.
4.9   Make changes in existing workbook templates
4.10   Validate numbers, dates, times & text.
4.11   Show custom validation.

5   **Solve engineering problems 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 function to compute summation, average, minimum value, maximum value, etc in engineering problem.

6   **Work with cell pointer to a particular cell.**
6.1   Use GOTO key to move the cell pointer to particular cell.
6.2   Use the ABSOLUTE KEY to change cell address from one from to another in formulae or in functions.
6.3   Enter range in formulae or in functions by typing directly or by using cell pointer.
6.4   Produce a nabbed range.
6.5   Use named range in formulae functions.
6.6   Copy cell range (one to one, one to many and to many) with special attention for copying formulae and functions.
6.7   Move cell range.
6.8   Erase cell ranges.

7   **Format a worksheet.**
7.1   Change the width of a column, a range of column, and change the columns width globally.
7.2   Insert blank columns and blank rows in a worksheet.
7.3   Delete columns and blank rows in a worksheet.

7.4 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.).

7.5 Format the display of data and of a worksheet globally or referring of cells.

7.6 Protect worksheet function, formula/important text and unprotect a range for entering entries.

7.7 Work with window for viewing worksheet in different ways and freeze rows or columns.

7.8 Produce, change and delete a style.

8 Exercise on setting up worksheet for printing.
8.1 Show the look of printing pages and sorting-searching of database
8.2 Produce and use page headers of footers.
8.3 Set print area, print titles and different print option
8.4 Print section of worksheet formulae and few pages
8.5 Print ranges from different worksheets on the same pages.
8.6 produce a database program
8.7 Sort a database in different in ways.
8.8 Search a record from the database using search criteria.
8.9 Extract records from the database that match a given criteria.
8.10 Delete records that a given criteria from the database using available database commands.

9 Create and Print graphs.
9.1 Produce bar, line, X-Y and pie graphs.
9.2 Add color, titles, legend, gird and levels to the graph.
9.3 Add visual impact with colors.
9.4 Produce linked pictures.
9.5 Save the graph and assign names to different graphs of a single worksheet.
9.6 Print graphs (low or high quality graphs.)
9.7 Plot graphs using a plotter using different colors.
9.8 Change graphs size, print & plot them.

10 Create Macros and using macro command languages.
10.1 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.
10.2 Produce a macro to convert values into labels vice versa.
10.3 Produce a macro for inserting blank rows between two rows of data in a worksheet.
10.4 Produce a macro for deleting the inserted blank rows in a worksheet.

DATABASE MANAGEMENT PACKAGE:

11 Create the new database.
11.1 Identify the practical database in real world.
11.2 Identify the fields and records of a database.
11.3 Identify the different phases of database design.
11.4 Collect the data form a typical field.
11.5 Determine the category of a typical field.

11.6 Design a typical Paper- pencil database form raw data.
11.7 Run a generalized database management package and identify its display
     Screen
11.8 Identify the different options of the selected packages.
11.9 Use the on-screen help facilities of DBMS package
11.10 Create and then save the table structure.

12   Change the table structure and edit database.
12.1 Modify the structure and correct mistake, if any.
12.2 Verify the structure (i.e. data of update, number of records. etc)
12.3 Enter or append the new records in the database.
12.4 Use the key combinations for editing.
12.5 Use the available options to edit fields.
12.6 Delete unwanted records and files.
12.7 Save & close database file.
12.8 Use different modes to append and edit records of database.

13   Search and display records and arrange the records of database.
13.1 View a database using list and display command
13.2 Retrieve the database records with different conditions.
13.3 Search within a field.
13.4 Keep the track of specific records.
13.5 Keep the database up-to-date.
13.6 Sort a database on single or multiple fields.
13.7 Sort with qualifier (i.e. sort with specific subset of records).
13.8 Index the database on single or multiple fields.
13.9 Use the function to index on different field types.
13.10 Use the commands for selective indexing and to control the order of records.

14   Create the customized data entry form.
14.1 Draw a typical data entry screen with paper-pencil work.
14.2 Design the screen with all fields.
14.3 Move the field to make the entry form logical and easy to use.
14.4 Change the field width.
14.5 Add or delete field (if necessary).
14.6 Change the display characteristics of fields.
14.7 Use picture functions template and range to format the displayed data.
14.8 Use different options and commands in design menu.
14.9 Draw lines and boxes on the form.

15   Create the query.
15.1 Display and identify query design screen.
15.2 Build a simple query
15.3 Save & apply the query.
15.4 Use the query design menu options.
15.5 Use the symbols and operators to build query.
15.6 Search the records with matching on two or more fields.
15.7 Select the records within range using range operators.

15.8   Find the records with inexact and complex matching.

15.9   Sort the records within queries.

16   Generate the custom reports.

16.1   Send the reports to the screener to a file.

16.2   Use the print menu options and dop-prompt options.

16.3   Produce a quick and selective report.

16.4   Plan the design of the report.

16.5   Design a custom columnar report.

16.6   Find the parts of a report specification.

16.7   Make the changes to the report specification.

16.8   Save & run the report.

17   Work with multiple database and relationship.

17.1   Merge the data form one file to another.

17.2   View the files to relate two or more database files.

17.3   Set up the relationship.

17.4   Modify the relationship.

17.5   Create the report from relational database.

DATABASE MANAGEMENT LANGUAGE:

18   Create a simple command file using expression and function.

18.1   Identify the database editor.

18.2   Use the commands to assign different types of data values to variables.

18.3   Save the memory variable.

18.4   Display the memory variable.

18.5   Release & restore the memory variable.

18.6   Use the mathematical expression.

18.7   Use the mathematical, relational, logical and string operators.

18.8   Use the common function such as EOF, BOF DATE, UPPER & LOWER< CTOD, DTOS, SPACE, TRIM, STR, etc. in command file.

18.9   Use the commonly use commands such as SET TALK, SKIP, RETURN in command file.

18.10 Use the commands to display a string of characters and wait for user response.

18.11 Use commands to display or print text.

19   Design & write a simple programs.

19.1   Identify the basic steps to design a program.

19.2   Write the pseudo code for simple program.

19.3   Convert the pseudo code into actual program code.

19.4   Verify & documents the simple program.

19.5   Save the command file and then exit.

19.6   Run the program.

20   Use the decision making commands.

20.1   Use DO WHILE ---- ENDDO, IF ---- ENDIF and DO CASE ---- ENDCASE to control program flow.

20.2   Use SCAN ---- ENDSCAN command instead of DO WHILE ---- ENDDO.
20.3   Use IF, ELSE and ENDIF commands to branch to the part the program.
20.4   Use nested IF ---- ENDIF statements.
20.5   Write simple program using decision making commands.
20.6   Use immediate IF function.
20.7   Write simple program using immediate IF function.
20.8   Use CASE ---- ENDCASE statement instead more than three IF ---- ENDIF statements.
20.9   Use the EXIT, CANCEL, WAIT and ZAP command in database program.
20.10 Use macro function within programs.

5840   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, global environmental issues, 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, soil and .pesticide pollution and
- To be able to understand the major environmental issues and problems in Bangladesh.

SHORT DESCRIPTION

Basic concepts of environment; Ecology & eco-systems; global environmental issues Air and atmospheric layers; Air pollution sources & effects; climate change, green house effect and depletion of ozone layer; Control of air pollution; Water pollution 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 and disaster management- Arsenic pollution; Pesticides pollution and its management, Environmental legislations and guidelines frame work and policy in Bangladesh.

DETAIL DESCRIPTION
1.   Understand the basic concepts of environment.
    1.1   Define: environment, Marine environment, Freshwater environment, Nutrients, Mangrove forest, Photo-chemical oxidant, Pollutant, Receptor, Sink, Pathways of pollutant, Speciation.
    1.2   Mention the main components of environment.
    1.3   Mention the functions of environment.
    1.4   Describe natural environment, man-made environment and social environment.

2.   Understand ecology and eco-systems.
    2.1   Define ecology and eco-system.
    2.2   Mention the range of tolerance in eco-system.
    2.3   Explain the biotic and a biotic components of eco-system.
    2.4   Explain briefly how does eco-system work.
    2.5   Explain the stability of eco-system.
    2.6   Explain the following ecological terms:
              Food chain, Food web, Biodiversity, Biomass, Ecological pyramid, Pyramid of biomass, Pyramid of energy, Bio-concentration, Bio-magnification, Restoration ecology.
    2.7   Narrate the following bio-geochemical cycles of eco-system.
        a)   Carbon cycle
        b)   Nitrogen cycle

c)   Phosphorus cycle
d)   Sulphur cycle.
e)   Hydrologic cycle

2.8   Describe the following global environmental issues: Global environment, Earth and other environmental summits, climate change and ozone layer depletion.

3   Understand the air and the atmospheric regions.
3.1   Mention different layers of atmosphere.
3.2   Mention the average composition of the atmosphere at sea level.
3.3   Describe the chemical species and particulates present in the atmosphere.
3.4   Describe the importance ozone layer.

4   Understand the air pollution and its sources & effects.
4.1   Define air pollution.
4.2   Mention the composition of clean dry atmospheric air.
4.3   List the air pollutants.
4.4   Identify the sources of air pollutions.
4.5   List the green house gases.
4.6   Mention the effects of air pollution on human health, animals, plants and non-living things.
4.7   Explain the formation of photo-chemical smog and its effect.
4.8   List the disasters of major air pollution in the world mentioning location, causes and effects.
4.9   Explain the causes of acid rain and its effect on eco-system.

5   Understand the control of air pollution at the sources.
5.1   Mention the methods of air pollution control.
5.2   Describe the following devices: gravitational settling chamber, cyclone separator, wet scrubber, centrifugal scrubber, fabric filter, catalytic converter.

6   Understand the sources of water pollution and its effects.
6.1   Define water pollution.
6.2   Mention the specification of ideal water as per recommendation of the World Heath Organization (WHO).
6.3   List the different types of water pollutants.
6.4   Describe the sources of water pollution.
6.5   Describe the effects of water pollution on human health, animal, plants and environment.

7   Understand the monitoring of water pollution.
7.1   Define the following terms:
(i)   Dissolved oxygen (DO).
(ii)   Biochemical oxygen demand (BOD).
(iii)   Chemical oxygen demand (COD).
(iv)   Total organic carbon (TOC).
(v)   Threshold limit value (TLV).
7.2   Mention the method of determination of pH value of water.

7.3   Mention the method of determination of dissolved oxygen (DO) in a sample of water.

7.4   Mention the method of determination of biochemical oxygen demand (BOD) in a sample of water.

7.5   Mention the method of determination of chemical oxygen demand (COD) in a sample of water.

8   Understand the waste water treatment.

8.1   Define the primary treatment, secondary treatment and tertiary treatment of waste water.

8.2   Define the following terms; ETP, Oxidation pond, waste stabilization pond, trickling filter, Activated slug.

8.3   Mention the methods of primary and secondary treatment of industrial waste water.

9   Understand the sound pollution and its control.

9.1   Define sound, sound wave and sound pollution.

9.2   Mention the scale of measuring sound intensity.

9.3   Mention the sources of sound pollution.

9.4   Describe the effect of sound pollution on human health.

9.5   Describe the methods of control of sound pollution.

10   Understand the soil pollution and its management.

10.1   Define soil pollution.

10.2   List the classification of soil pollution.

10.3   Mention the sources of soil pollution.

10.4   Describe the effect of soil pollution on human health.

11   Understand the radioactive pollution and its control.

11.1   Define radioactive pollution.

11.2   Mention the sources of radioactive pollution.

11.3   List the causes of radioactive pollution.

11.4   Explain the effect of radioactive pollution on human health.

11.5   Describe the method of control of radioactive pollution.

12   Understand the solid waste management.

12.1   Define solid waste.

12.2   List the sources of solid waste.

12.3   Mention the classification of solid waste.

12.4   Mention the methods of collection of solid waste.

12.5   Mention the waste management strategies in Bangladesh.

12.6   Describe the recycling of solid wastes.

12.7   Describe the potential method of disposal of solid waste.

13   Understand the major environmental issues in Bangladesh.

13.1   List the major environmental issues in Bangladesh.

13.2   Describe the following disaster management of Bangladesh

flood, cyclone, tidal surge, Cyclone(SIDR, AILA, Nargis, Tsunami), landslide, earthquakes and salinity.

14   Understand the arsenic pollution in Bangladesh.
14.1   Mention the arsenic pollution of water in Bangladesh.
14.2   Explain the effects of arsenic pollution on human health.
14.3   Describe the causes of arsenic in ground water.

15   Understand the pesticide pollution in Bangladesh and its management.
15.1   Define pesticide.
15.2   Make a list of pesticides.
15.3   Mention the causes of pesticide pollution in Bangladesh.
15.4   Describe the effect of pesticide pollution in the environment.

16   Understand the national environmental legislations and guidelines environmental frame work and policy in Bangladesh.
16.1   Define, EA, EIA, IEA, NEMAP, DOE, BELA, GPS, GIS
16.2   Mention environmental act and legislations prescribed for air and water quality.
16.3   Describe environmental act prescribed for industries in Bangladesh.
16.4   Describe the guide lines of environment prescribed for industries in Bangladesh.
16.5   Describe the environmental frame work in Bangladesh.

REFERENCE BOOKS

১.   পরিবেশ দূষণ (১ম ও ২য় খন্ড)
                        —   আবদুল মালেক ভূইয়া —   গৌতম পাল
২.   বিপন্ন পরিবেশ ও বাংলাদেশ
                        —   ডঃ এফ এম মনিরুজ্জামান
৩.   বায়ু ও পানি দূষণ এবং প্রতিকার
                        —   মুহাম্মদ কাউছার হাবিব ভূইয়া
৪.   পরিবেশ বিজ্ঞান
                        —   মুহাম্মদ কাউছার হাবিব ভূইয়া
৫.   শব্দ ও তেজষ্ক্রিয় দূষণ এবং প্রতিকার
                        —   মুহাম্মদ কাউছার হাবিব ভূইয়া
৬.   মাটি ও তেজষ্ক্রিয় দূষণ এবং প্রতিকার
                        —   মুহাম্মদ কাউছার হাবিব ভূইয়া
7.   Pollution control in process industries
                —   S. P. Mahajan
8.   Environmental Engineering
                —   Peavy, Rowe and Techobanglous
9.   Air pollution
                —   V. P. Kudesia
10.   Industrial Noise Control
                —   Bruce Fader
11.   Pesticide Pollution
                —   Kudecsia and Charaya

12. Water Pollution
– V. P. Kudesia
13. Peoples Report on Bangladesh Environment 2001
Atia Rahman, M. Ashraf Ali and Farooque Choudhury