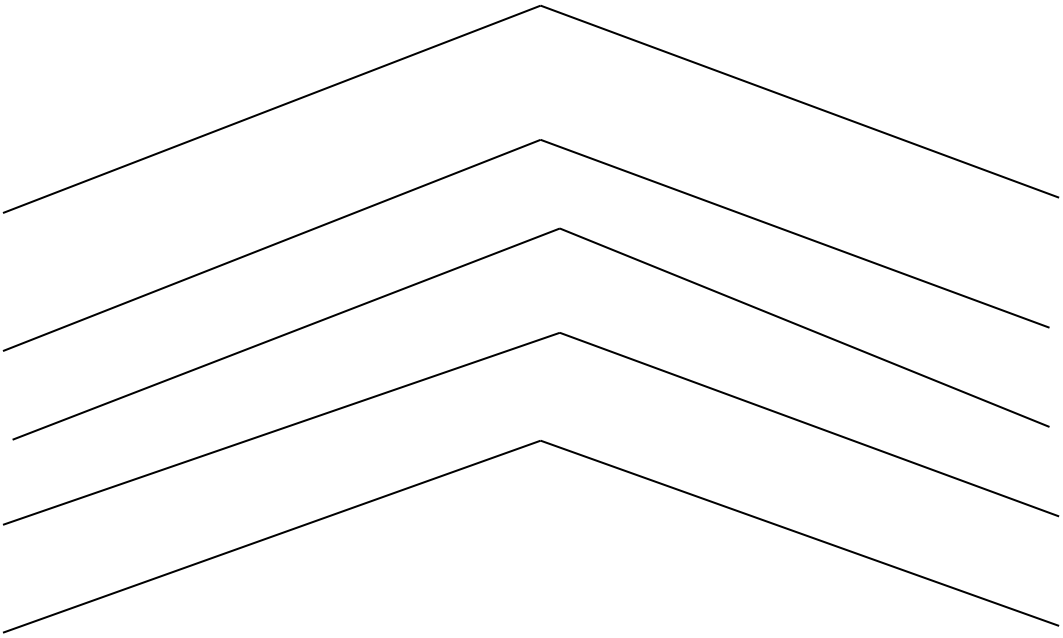
**BANGLADESH TECHNICAL EDUCATION BOARD**



# 4- YEAR

## GARMENTS TECHLOGY

# SYLLABUS

## 6TH SEMESTER

# 4-YEAR DIPLOMA IN TEXTILE ENGINEERING PROGRAM
# GARMENTS TECHNOLOGY
# COURSE STRUCTURE

## 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. | 5061 | Garments manufacturing –III | 3 | 3 | 4 | 30 | 120 | 25 | 25 | 200 |
| 2. | 5062 | CAD & CAM-I | 2 | 6 | 4 | 20 | 80 | 50 | 50 | 200 |
| 3. | 5063 | Apparel testing | 3 | 3 | 4 | 30 | 120 | 25 | 25 | 200 |
| 4. | 5064 | Garments production planning and control | 3 | 0 | 3 | 30 | 120 | - | - | 150 |
| 5. | 5065 | Maintenance of garments manufacturing machine | 1 | 6 | 3 | 10 | 40 | 100 | 00 | 150 |
| 6. | 5841 | Business organization & Communication | 2 | 0 | 2 | 20 | 80 | - | - | 100 |
| 7. | 5840 | Environmental management | 2 | 0 | 2 | 20 | 80 | - | - | 100 |
| | | **TOTAL** | **16** | **18** | **22** | **160** | **640** | **200** | **100** | **1100** |

**5061 GARMENTS MANUFACTURING – III**

| T | P | C |
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| 3 | 3 | 4 |

**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, sewing thread package & working aids.
- Fault of sewing.

**Short Description**

Understand the basic concept of Interlining; Fusing; Coating; Feed mechanism of sewing machine; Sewing needles; Sewing thread; Sewing thread package; Faults of sewing; Knit fabric; Machinery for seaming knit 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 & flat bed fusing machine.
2.5 Describe continuous fusing process.
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 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 Understand 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 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 breaking during sewing.
5.6 Describe different needle points.
5.7 Describe needle cutting point & cloth point with sketch.

**6 Understand the sewing thread.**

6.1 Define sewing thread.
6.2 Describe the types of sewing 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 & cone.

**8 Understand the knit fabric.**

8.1 Mention the yarn properties for making knit fabrics.
8.2 Describe the properties of knit fabric.
8.3 Mention the steps of knit garments production.
8.4 Describe the process of knit garments production.
8.5 Describe different categories of knit garments according to general production method of knit garments.
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 used 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 (tightness) 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.

**11.0 Understand of working aids.**

11.1 Define working aids.
11.2 Function of working aids.
11.3 List of working aids.
11.4 Describe different types of working aids.

**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.

**REFERENCE BOOKS:**

1. Garments and Techniques – Prof. M.A. Kasem.
2. Knitting Technology – David-j-spencer.
3. Garments production- J.S Cooklin.
4. Pattern making- Amstrong.

**5062** **CAD & CAM-I**

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**AIMS**

- To develop basic knowledge of different garments CAD & CAM software and hardware.
- To acquaint practical knowledge, skill and attitude in the area of different CAD & CAM software and hardware.

**SHORT DESCRIPTION**

Basics concept of garments CAD & CAM, object of CAD use of different types of CAD software, CAD hardware, block creation, digitizing, grading, marker making, digital pattern conversion, automatic fabric cutting & process control.

**DETAIL DESCRIPTION**

**Theory:**

**1 Understand the software & hardware used in garments and fashion industry.**

1.1 Explain & elaborate the CAD.
1.2 Object of CAD.
1.3 Describe different types of CAD software used in garments & fashion industry.
1.4 Describe different types of CAD hardware configuration.
1.5 Describe block creation by CAD software.

**2 Understand the digitizing.**

2.1 Define pattern processing, digitization & PDS.
2.2 Describe digitizing process of creating production pattern.
2.3 Define edit digitize.
2.4 Describe image creation & manipulation.
2.5 Describe different software key function.

**3 Understand the principles of computer grading.**

3.1 Define grading.
3.2 Explain grade rule editor.
3.3 Describe the pattern designing.
3.4 Describe the preparation of grading by CAD software

**4 Understand the marker making.**

4.1. Describe the preparation of marker by using CAD.
4.2. Describe marker creation editors.
4.3. Understand the marker making model editors, order editors, order process, auto marker edit, order activity log.
4.4. Describe the consumption of fabric in CAD software.

**5 Understand the digital pattern conversion & creation in CAD software.**

5.1 Define AMMA DXF file (all), MDL file (lectra), IBA file (lectra), TMP file (garbar), HPGL & PLT file (all).
5.2 Describe AMMA DXF file with features.
5.3 Describe HPGL & PLT file.

**6 understand automatic fabric cutting & process control by CAD.**

6.1 Describe the basic requirements of fabric cutting by CAM.

6.2 Identify problems of CAD software.
6.3 Define plotting & cutting.
6.4 Describe marker plot & piece plot.
6.5 Describe the parameters of marker plot & piece plot.

**PRACTICAL:**

1. Draw the CAD & plotter.
2. Draw digitizing board & cursor.
3. Draw and identify the different parts of pattern cutter.
4. Make basic block of shirt by CAD software.
5. Make basic block of pant by CAD software.

**5063** **APPAREL TESTING**

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**Aims**

- To provide the students with an opportunity to acquire practical and theoretical knowledge about different standard organization testing procedure of fabrics and garments.
- To get idea about inspection of fabric and garments quality control and process control.

**Short Description**

Understand the basic aspects of different standard organization; Fabric testing and measurements; Crimp of yarn in fabric; Crimp measurement of woven and knit fabric; Air permeability; Crease resistance and crease recovery measurement; Pilling of fabric, drape test flamality test, shrinkage test. Colour fastness test, grey scale test assessment and fastness rating. Garments sampling method, check list of garments inspection, inspection of different stages of garments production. Seam strength, seam slippage & quality of Sewing, Statistical quality control, duties and responsibility of quality control department.

**Detail Description**

**THEORY**

**1. Understand about standard organization.**

1.1 Definition standard organization.
1.2 Function of standard organization.
1.3 Name of the standard organization.
1.4 Function of Bangladesh standard testing institute (BSTI).
1.5 Function of International standard organization (ISO).

**2. Understand the fabric testing.**

2.1 Explain the importance of fabric testing.
2.2 Mention the name of different types of fabric testing.
2.3 Describe the methods of fabric strength measurement.
2.4 Describe the methods of fabric width measurement.
2.5 Describe the methods of fabric (woven & knit) weight measurement.

**3. Garments sampling methods.**

3.1 Understanding sampling & define sampling.
3.2 Types of sampling in apparel manufacturing.
3.3 Methods of sampling of garments.

**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 gauge with its working procedure.

**5. Understand the crimp & its measurement and air permeability of fabric.**

5.1 Define crimp.
5.2 Mention the objects of crimp.

5.3 Describe the points to be considered during crimp.
5.4 Mention the names of crimp measurement instrument.
5.5 Describe the WIRA crimp meter with its working procedure and precaution.
5.6 Define air permeability, air resistance and air porosity.
5.7 Describe the principles of air permeability measurement.
5.8 Describe Shirley air permeability apparatus.

**6. Understand the crease resistance and crease recovery with their measurements.**

6.1 Define crease.
6.2 Mention the effects of crease.
6.3 Define crease resistance & crease recovery.
6.4 Mention the names of crease recovery instruments.
6.5 Describe the total crease recovery tests.

**7. Understand the fabric stiffness, handle and drape.**

7.1 Define fabric stiffness handle & drape.
7.2 Mention the factors influencing fabric stiffness, handle & drape.
7.3 Define bending length, flexible rigidity and bending modules.
7.4 Explain the principles of stiffness measurement.
7.4 Mention the names of stiffness measurement instruments.
7.5 Describe Shirley stiffness tester with its basic principles.
7.6 Describe the working procedure of Shirley shiftness tester.

**8. Understand the abrasion resistance & its measurement & fabric shrinkage.**

8.1 Define abrasion resistance, plain or flat abrasion, edge abrasion and flex abrasion.
8.2 Mention the causes of abrasion.
8.3 List the factors considered before abrasion resistance measurement.
8.4 Mention the names of instruments for abrasion resistance measurement.
8.5 Explain abrasion resistance.
8.6 Describe the working principle of martindle abrasion tester.
8.7 Define fabric shrinkage.
8.8 Mention the types of shrinkage.
8.9 Describe the methods of shrinkage measurement.

**9. Understand the fastness properties of fabric and its measurement.**

9.1 Define fastness.
9.2 Mention the types of fastness property of fabric.
9.3 Describe sample method for fastness test.
9.4 Describe the method of colour fastness test to washing.
9.5 Describe the methods of colour fastness test to perspiration.
9.6 Describe the methods of colour fastness test to light.

**10. Understand the use of miscellaneous testing instruments.**

10.1 Explain the importance of miscellaneous testing instruments.
10.2 Mention the effects of tension of textiles materials in different production stage.
10.3 Describe the working principle of tension meter.
10.4 Describe stroboscope with main principles and working procedure.
10.5 Define techometer.
10.6 Mention the type of techometer.
10.7 Explain the working procedure of techometer.

**11. Check list of garments inspection.**

11.1 Major check list of garments inspection.
11.2 Define initial & inline (In process) inspection.
11.3 Define final inspection.
11.4 Mention a table for check lists of final garments inspection.
11.5 Describe packaging inspection check lists for garment accessories.

**12. Inspection of different stages of garments production.**

12.1 Mention the different stages/steps inspection of garment production.
12.2 Describe initial inspection of garment production.
12.3 Describe in-line inspection of garment production.
12.4 Describe final inspection of garment production.

**13. Seam strength & seam slippage.**

13.1 Define seam strength.
13.2 Necessity of seam strength.
13.3 Define seam slippage.
13.4 Procedure for finding the seam slippage.
13.5 Explain the minimization of seam slippage.
13.6 Mention the problems occurred for seam slippage.

**14. Quality of sewing & statistical quality control.**

14.1 Understanding the Quality of sewing.
14.2 Explain the factors depending on sewing of quality.
14.3 Define statistical quality controls (SQC).
14.4 Factor depending on statistical quality control.
14.5 Necessity of quality control.

**15. Duties & responsibility of Quality control department.**

15.1 Lists of duties & responsibility of quality control department.
15.2 Mention the duties of quality control supervisor.
15.3 Mention the duties & responsibility of quality control incharge (team leader).

**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 crease resistance & crease recovery of a fabric by crease tester.
6 Determine the fabric drape properties by a fabric tester.
7 Determine the fabric abrasion resistance by using a fabric abrasion tester.
8 Determine the fabric shrinkage after wash with suitable washing machine.
9 Determine the color fastness of a colored fabric.
10 Determine the seam slippage by seam slippage tester.

## 5064 GARMENTS PRODUCTION PLANNING AND CONTROL

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**Aims**

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- 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**

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

**Detail Description**

**Theory**

**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 of planning 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 encounter.

**5. Understand the material management.**

5.1 Define material management.
5.2 Describe purchase procedure.
5.3 Describe distribution system.
5.4 Describe measurements of performance of material management.
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 its gant chart.

**REFERENCE BOOKS:**

1. Production planning & control- J.H spencer.
2. Production planning in industry-Kelvein.

## 5065 MAINTENANCE OF GARMENTS MANUFACTURING MACHINE

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### 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

Understand the basic aspects of 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 pulley 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.

**6 Understand the air conditioning system in garments industry.**

6.1 Describe comfort condition of garments industry.
6.2 Describe psychometric chart of 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 hazards.
7.2 Mention the potential hazard in garments industries.
7.3 Mention safety measure taken for garments factory.
7.4 Mention safety rules.
7.5 Describe factory act & BEPZA rules.
7.6 Describe fire fighting equipments & fire extinguisher.
7.7 Describe pollution created in garments factory.
7.8 Describe first aid needed for garments factory.
7.9 Define OSH (operational safety & health) & its importance.

**8 Understand the maintenance procedure of different garments machines.**

8.1 Describe the importance of maintenance
8.2 Describe routine maintenance procedure of different industrial sewing machines.
8.3 Describe maintenance system of fabric spreading & cutting machine.
8.4 Describe the repair maintenance, setting, replacing of different parts of rotary knife, straight knife, bent knife, drill machine & 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 bobbin 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 Draw the diagram of a bent knife cutting machine & indicate its important parts.
11 Disassemble and assemble a bent knife cutting machine.
12 Draw the diagram of a fabric drill machine and indicate its important parts.
13 Disassemble and assemble a fabric drill machine.
14 Lubricate different point of sewing machine.

## *REFERENCE BOOKS*

1. Applied Mechanics- Kurmi.
2. Mechanical terms & defination- Abner.
3. Textile Mechanics-Hangton.

**5841 BUSINESS ORGANIZATION & COMMUNICATION** T 2 P 0 C 2

## AIMS

- To be able to understand the basic concepts and principles of business organization.
- To be able to understand the banking system.
- To be able to understand the trade system and stock exchange activities in Bangladesh.
- To be able to understand the basic concepts of communication and its types, methods.
- To be able to perform in writing, application for job, complain letter & tender notice.

## SHORT DESCRIPTION

Principles and objects of business organization; formation of business organization; banking system and its operation; negotiable instrument; stock exchange; home trade and foreign trade. Basic concepts of communication model & feedback; types of communication; methods of communication; formal & informal communication; essentials of communication; report writing; office management; communication through correspondence; official and semi- official letters.

## Detail description

**1 Understand business organization.**

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

**2 Understand the formation of business organization.**

2.1 Define sole proprietorship, partnership, Joint stock company. And co-operative
2.2 Describe the formation of sole proprietorship, partnership, joint stock company & co operative.
2.3 Mention the advantages and disadvantages of proprietorship, partnership and joint stock company.
2.4 State the principles of co operative & various types of co operative.
2.5 Discuss the role of co-operative society in Bangladesh.

**3 Understand the banking system and negotiable instrument.**

3.1 Define bank.
3.2 State the service rendered by bank.
3.3 Describe the classification of bank in Bangladesh.
3.4 State the functions of Bangladesh bank in controlling money market.
3.5 State the functions of commercial bank in Bangladesh
3.6 Mention different types of account operated in a bank.
3.7 Mention how different types of bank accounts are opened and operated.
3.8 Define negotiable instrument.
3.9 Discuss various types of negotiable instrument.
3.10 Describe different types of cheque.
3.11 Define letter of credit.

**4 Understand the home & foreign trade**

4.1 Define home trade & foreign trade.
4.2 Describe types of home trade.

4.3 Differentiate between whole sale trade and retail trade.
4.4 Define foreign trade.
4.5 Mention the advantages and disadvantages of foreign trade.
4.6 Mention the classification of foreign trade.
4.7 Discuss the import procedure & exporting procedure.
4.8 Discuss the importance of foreign trade in the economy of Bangladesh.

**5 Understand the basic concepts of communication**

5.1 Define communication & business communication.
5.2 Describe the scope of business communication.
5.3 State the objectives of business communication.
5.4 Discuss the essential elements of communication process.

**6 Understand the communication model and feedback.**

6.1 Define communication model.
6.2 State the business functions of communication model.
6.3 Define feedback.
6.4 State the basic principles of effective feedback.
6.5 Explain the essential feedback to complete communication process.

**7 Understand the types of communication.**

7.1 Explain the different types of communication.
7.2 Distinguish between upward and downward communication.
7.3 Define two-way communication.
7.4 Describe the advantages and disadvantages of two-way communication.
7.5 Define formal & informal communication.
7.6 Describe the advantages and disadvantages of formal & informal communication.
7.7 Distinguish between formal and informal communication.

**8 Understand the methods of communication.**

8.1 Define communication method.
8.2 Discuss the various methods of communication.
8.3 Describe the advantages and disadvantages of oral communication.
8.4 Describe the advantages and disadvantages of written communication.
8.5 Distinguish between oral and written communication.

**9 Understand the essentials of communication.**

9.1 Discuss the essential feature of good communication.
9.2 Describe the barriers of communication.
9.3 Discuss the means for overcoming barriers to good communication.

**10 Understand the report writing.**

10.1 Define report, business report & technical report.
10.2 State the essential qualities of a good report.
10.3 Describe the factors to be considered while drafting a report.
10.4 Explain the components of a technical report.
10.5 Distinguish between a technical report and general report.
10.6 Prepare a technical report.

**11 Understand the office management.**

11.1 Define office and office work.
11.2 State the characteristics of office work.

11.3 Define filing and indexing.
11.4 Discuss the methods of filing.
11.5 Discuss the methods of indexing.
11.6 Distinguish between filing and indexing.

**12 Understand the official and semi-official letters.**

12.1 State the types of correspondence.
12.2 State the different parts of a commercial letter.
12.3 Define official letter and semi-official letter.
12.4 Distinguish between official letter and semi-official letters.
12.5 Prepare the following letters: interview letter, appointment letter, joining letter and application for recruitment. Complain letters, tender notice.

**5840 ENVIRONMENTAL MANAGEMENT**

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**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 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.

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