BANGLADESH TECHNICAL EDUCATION BOARD

4-YEAR DIPLOMA-IN-ENGINEERING

PROGRAM

FOOTWEAR TECHNOLOGY (698)

SYLLABUS

SIXTH SEMESTER

Footwear Technology (698)

6th Semester

Sl No	Sub. Code	Name of the Subject	T	P	C	Marks				Total
						Theory		Practical		
						TC	TF	PC	PF	
1	69861	Footwear CAD and CAM	3	3	4	60	90	25	25	200
2	69862	Leather Technology -I	2	3	3	40	60	25	25	150
3	69863	Testing of Footwear Materials and Accessories	3	3	4	60	90	25	25	200
4	69864	Footwear Production Technology	0	6	2	-	-	50	50	100
5	66651	Programming in Java	2	3	3	40	60	25	25	150
6	65853	Innovation and Entrepreneurship	2	0	2	40	60	-	-	100
	Total=		12	18	18	240	360	150	150	900

69861	Footwear CAD and CAM	T	P	C
		3	3	4

OBJECTIVES

- To understand the basic knowledge about footwear CAD andCAM
- To learn and familiar with various Industrial automation
- To identify and learn Computer Aided Design (CAD) used in footwear manufacturing
- To identify and learn Computer Aided Manufacturing (CAM) used in footwear manufacturing
- To identify and analyze Computer Integrated Manufacturing (CIM) in footwear manufacturing

SHORT DESCRIPTION

This course deals with the understand of the basic knowledge about footwear manufacturing related CAD andCAM, learn and familiar with various Industrial automation, identify and learn Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) used in footwear manufacturing as well as familiar with the principle,effectiveness,advantages and disadvantages of computer integrated manufacturing(CIM).

Theory:

1. Understand industrial automation

1.1 Define industrial automation.
1.2 List out different types of industrial automation
1.3 State the development of automation
1.4 Describe the development of computers and application of computers to manufacturing

2. Understand computer integrated manufacturing

2.1 Define computer integrated manufacturing.
2.2 State the Principles of CIM
2.3 Recognize essentials of computer-integrated manufacturing systems
2.4 Describe the effectiveness of CIM
2.5 List out advantages and disadvantages of CIM

3. Comprehend the basic knowledge about CAD andCAM

3.1 Define Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM)**.**
3.2 Identify the importance of CAD/CAM
3.3 Describe function of Computer in CAD/CAM
3.4 Recognize the role of CAD/CAM Technology in Footwear
3.5 Explain the designing involved in CAD/CAM

4. Understand computer aided design(CAD)

4.1 Define CAD and its application in different sector of footwear technology.
4.2 Draw line, square, rectangle, triangle, etc. using absolute and incremental system
4.3 Apply CAD for simple operations like moving, copying, rotating, trimming, breaking, linear, angular and dimensioning system

4.4 Discuss Geometric modeling-2D and 3D models, surface models, solid modelsof optimum design

4.5 Interpret Computer-automated process planning, automated manufacturing planning-function involved in AMP

4.6 Describe computer-aided routing (CAR), CAR system flow.

5. Illustrate the basic of CAD/CAM technology

5.1 Define Principles and scope of CAD hardware and software in CAD

5.2 Identify CAM, NC, CNC devices for computer aided cutting including laser and water jet; computer aided stitching, robots in footwear manufacture.

5.3 Explain digitization: 2D and 3D coordinate extraction, principles of digital to analog conversion, digital input/output processing systems

5.4 Discuss programming techniques and languages, computerized techniques, principles and strategies for collection of data for imaging, rendering, data reduction and processing techniques with special reference to footwear design

5.5 Describe automatic machine tools for mass production; computer-controlled manufacturing systems; automated assembly, automatic materials handling, industrial robots, industrial robots in manufacturing.

6. Understand CAD for footwear

6.1 Define CAD used in footwear manufacturing.

6.2 List out input and out-put devices required for CAD

6.3 Describe working principles for footwear and leather-products manufacturing.

6.4 Explain use of 2D and 3D techniques for ladies, gents and babies footwear; designing, pattern design and grading, pattern production, materials calculation etc.

6.5 Describe Shoe master and Crispin software designing system, their application, advantages and limitations.

7. Understand CAM for footwear

7.1 Define CAM used in footwear manufacturing.

7.2 List out various CAM used in footwear manufacturing.

7.3 Identify tools required in CAM.

7.4 Mention application of CAM in footwear manufacturing

8. Understand Advance Grading and Pattern Engineering in CAD / CAM System

8.1 Mention importance of CAD / CAM Grading

8.2 Interpret role of Grading in Footwear

8.3 State basic principles of CAD/ CAM Grading

8.4 Manipulate of Sizes and sizing system

8.5 List out advantages of CAD/ CAM Grading

Practical:

1. To digitize the components of shoe, boot, sandal and slippers.
2. To perform Digitizing of Bottom and upper components.
3. To perform design for the major components of men's Derby Shoe using CAD/CAM Software.
4. To perform design for the major components of men's Monk Derby Shoe using CAD/CAM Software.

5. To perform design for the major components of men's Apron Derby Shoe using CAD/CAM Software.
6. To perform design for the major components of women's Derby Shoe using CAD/CAM Software.
7. To performdesign for the major components of men's Oxford Shoe using CAD/CAM Software.
8. To perform design for the major components of women's Oxford Shoe using CAD/CAM Software.
9. To perform design for the major components of men's Pantafola using CAD/CAM Software.
10. To performdesign for the major components of Ladies Court Shoe using CAD/CAM Software.
11. To perform design for the major components of women's Sandal using CAD/CAM Software.
12. To perform design for the major components of men's Ankle Boot Shoe using CAD/CAM Software.
13. To perform design for the major components of men's Moccasin Shoe using CAD/CAM Software.
14. To measure the master standard of the components of shoe, boot, sandal and slippers.
15. To performModification the components of shoe, boot, sandal and slippers
16. To perform the Marking by using CAD/CAM software
17. To perform CAD/CAM grading of upper patterns
18. To perform CAD/CAM grading of sole patterns
19. To performCAD/CAM grading of insole patterns
20. To perform CAD/CAM grading of lining patterns

References

1. Harrington, J.- Computer Integrated Manufacturing.
2. Singh, N.- Systems Approach to Computer-Integrated Design and Manufacturing.
3. Boothroyd G.- Assembly Automation and Product Design.
4. Chang T.C.- Wysk, R.A and Wang, H.P.- Computer-aided manufacturing.
5. Pivecka J.- Practical Handbook on Shoe Production.
6. Americal Shoe Making, Shoe Trades Publishing Co.
7. Hitomi K.- Manufacturing System Engineering.
8. Sadhu Singh- Computer Aided Design and Manufacturing.
9. Shoemaster- World Leaders in CAD/CAM technology "PATTERNS USRES GUIDE".
10. Leather Technology Mission- SHOE DESIGNING

Required software:

1. Shoe Master
2. Crispin

69862	Leather Technology - I	T	P	C
		2	3	3

OBJECTIVES

- To develop knowledge on raw hides and skins
- To develop knowledge on leather manufacturing techniques.
- To be able to produce good quality leather**.**

SHORT DESCRIPTION

Raw hides and skins;structure and composition of hides and skins, grain pattern, defects of hides and skins, curing, soaking, liming, deliming, bating, pickling, chrome tanning; vegetable tanning.

DETAIL DESCRIPTION

Theory:

1 Understand the basic concepts on hides and skins.

1.1 Define hides, skins and leather.
1.2 State the composition of hides and skins.
1.3 Sketch and explain the structure of hides and skins.
1.4 Mention briefly about the slaughtering and flaying.
1.5 Compare the grain pattern among cow hide, buffalo hide, goat skin and sheep skin.
1.6 Categorize the fibrous and non-fibrous proteins of hides and skins.
1.7 Describe the different types of defects of hides and skins.

2 Understanding about curing of hides and skins.

2.1 Define curing of hides and skins.
2.2 Mention types of curing techniques.
2.3 Discuss details about wet salted method of curing.
2.4 Show the mechanism of curing with salt.
2.5 Chooseecofriendly techniques for curing in Bangladesh.
2.6 Compare between wet salted and dry salted curing process.
2.7 Mention advantage and disadvantage of curing of hides and skins.

3 Understand concepts of soaking.

3.1 Define the terms soaking and wetting.
3.2 Describe the major objectives of soaking.
3.3 Discuss different techniques of soaking.
3.4 Discuss the theory of wetting.
3.5 State the action of soaking agent on collagen.
3.6 Mentionsomeapplication of preservatives in soaking.

4 Understand the basic concepts liming.

4.1 Define unhairingand liming.
4.2 Describe the chemistry of unhairing of hides and skins.

4.3 State the different types on unhairing.
4.4 Discuss the objectives of liming.
4.5 Integrate the effects of lime on collagen.
4.6 Show the mechanism of unhairing.
4.7 Mention the chemistry of enzyme on unhairing.
4.8 State the environment friendly liming agent.

5 Understand the concepts of deliming and bating.

5.1 Define deliming and bating.
5.2 List out the deliming and bating agents.
5.3 Mention the necessity of deliming and bating.
5.4 Discuss the chemistry of proteolytic enzymes used inbating.
5.5 Describe the functions of different component in synthetic bate in bating operation.
5.6 Compare between acid bates and alkali bates.
5.7 Discuss the properties of bating agents.
5.8 Application of bating agent.

6 Understandpickling process.

6.1 Mention the objectives of pickling.
6.2 Importance of pickling in leather processing.
6.3 Significance of acids and salt in pickling process.
6.4 Discuss the effect of different acids and salt on leather quality.
6.5 Describe the use of acid syntans in pickling.

7 Understand the basic concepts of chrome tanning.

7.1 Describe the basic concept of tanning.
7.2 State the historical development of tanning.
7.3 Discuss the different types of tanning.
7.4 Discuss the natural and synthetic tanning materials.
7.5 Mention the theory of chrome tanning.
7.6 State factors affecting on chrome tanning and its effect wet blue leather production.
7.7 Describe advantage and disadvantage of chrome tanning.

8 Understand the concepts of vegetable tanning.

8.1 Define vegetable tanning materials.
8.2 Mention the source of vegetable tanning materials.
8.3 Categorize the vegetable tanning materials.
8.4 Classify vegetable tannin.
8.5 State the mechanism of vegetable tanning.
8.6 Discuss the degree of tannage.
8.7 Discuss the manufacturing techniques of different vegetable tanning process.
8.8 Describe the factors effecting vegetable tanning process.
8.9 Advantage and disadvantage of vegetable tanned leather.

PRACTICAL

1. **Identify different types of hides and skins**
2. **Practice on curing of hides/skins.**
3. **Produce wet blue leather comparing the soaking effect with different soaking agent.**
4. **Produce wet blue leather comparing the liming effect with lime and unhairing agent.**
5. **Practice on fleshing and unhairing operation**
6. **Practice on scudding operation.**
7. **Produce wet blue leather comparing the bating effect with acid bate and alkali bate.**
8. **Manufacturing ofwet blue leather performing the following tasks**
   - 7.1 Select Materials
   - 7.2 Desalting and weighing
   - 7.3 Soaking
   - 7.4 Liming
   - 7.5 Unhairing and fleshing
   - 7.6 Weighing
   - 7.7 Deliming and bating
   - 7.8 Scudding
   - 7.9 Pickling
   - 7.10 Chrome tanning
   - 7.11 Basification
   - 7.12 Piling and ageing

8 Manufacture of vegetable tanned leather performing the following tasks

- 8.1 Collect raw hides/skins
- 8.2 Desalting and weighing
- 8.3 Soaking
- 8.4 Liming
- 8.5 Unhairing and fleshing
- 8.6 Weighing
- 8.7 Deliming and bating
- 8.8 Scudding
- 8.9 Pickling
- 8.10 Vegetable tanning

References

1. K.T.Sarkar-Theory and Practice of Leather Manufacture.
2. S.S. Dutta- An introduction to the principles of Leather Manufacture.
3. O'Flaherty, Roddy, Robert W.T.M. Lollar (Ed)-The Chemistry and Technology of Leather, Volume - 1.
4. Gerhard John- Possible Defects in Leather Production.
5. R.Reed - Science for the students of the Leather Technology.
6. H.R. Proctor - The principles of Leather Manufacture.
7. JotirmayDey - Practical Aspects of the Manufacture of upper Leathers.
8. Leather Technicians Handbook- Sharp house.
9. Raw Hides and Skins: Structure, defects and curing, Noor Mohammad, the sky publishers, Dhaka

69863	Testing of Footwear Materials and Accessories	T	P	C
		3	3	4

OBJECTIVES

- To be able to identify the quality of upper and liningmaterials.
- To be able to identify the quality of sole and insole materials.
- To be able to identify the quality of complete footwear.
- To be able to conduct different tests for upper, lining, sole and insoleand other allied materials of footwearfollowing standard operating procedure.

SHORT DESCRIPTION

This course deals with the understanding and performing of the basic testing procedure with the help of both hand and machine for footwear materials and accessories. This course is designed from the sampling and conditioning of test piece to the standard procedure of important tests like strength, flexibility, hardness, permeability, chemical, Tests etc. which are essential to assess the quality of footwear materials and accessories.

DETAIL DESCRIPTION

Theory:

1 Understanding to perform sampling and conditioning of test piece.

1.1 Define sampling and conditioning.
1.2 Explain the statistical aspects of the sampling.
1.3 Illustrate the sections of leather.
1.4 Describe the process to calculate official sampling position of leather for both physical and chemical tests.
1.5 State the procedure of conditioning for test piece before testing.
1.6 Justify the importance of conditioning for test piece.

2 Perform thumb test for upper materials.

2.1 Define thumb tests
2.2 Classify thumb tests
2.3 Explain the procedure of a few popular thumb tests for upper leather.
2.4 Criticize the disadvantages of thumb tests.

3 Understanding the procedure of testing for flexing.

3.1 Define vamp flexing test.
3.2 Describe in brief whole shoe flexing.
3.3 State the principles of flexing test for upper, sole and insole materials.
3.4 Write the official methods for vamp flex test to assess upper and lining materials.

3.5 Describe a variety of different methods to simulate flex cracking failure of sole material.
3.6 Explain the justification of flexing tests for footwear materials.

4 Perform tests for waterproofness and water vapour permeability of upper materials.

4.1 Define waterproofness and water vapour permeability.
4.2 Differentiate between waterpoofness and water resistance property of upper material.
4.3 Distinguish between water vapour absorption (WVA) and water vapour permeability (WVP).
4.4 State the official methods to determine the waterproofness property of upper material.
4.5 State the official methods to determine the water vapour permeability of upper material.
4.6 Mention the advantages of waterproofness and permeability test for upper materials.

5 Testing for colour fastness and the adhesion property of footwear materials.

5.1 Define colour fastnessand adhesion.
5.2 Differentiate between grey scale and blue scale.
5.3 Describe rub fastness, heat fastness, and light fastness of upper materials.
5.4 Mention the importance of colour fastness testing of footwear mates.
5.5 Describe the principle and official methods to determine the finish film adhesion strength of upper material.
5.6 State the principle and official methods for sole adhesion test.
5.7 Describe the importance of adhesion test for footwear materials.

6 Understanding the hardness and slip resistance of soling materials.

6.1 Define hardness of soling materials.
6.2 Mention the importance of slip resistance of soling materials.
6.3 State in brief about the hardness property of soling materials.
6.4 Describe the principle and official method for determining the slip resistance of different soling materials.

7 Understanding the testing of accessories for footwear manufacture.

7.1 Describe the different types of accessories used in footwear manufacture.
7.2 Explain the properties of accessories.
7.3 State the methods for essential testing of accessories.
7.4 Mention the disadvantages of poor quality accessories.

8 Understanding the chemical testing of footwear materials.

8.1 List the name of essential chemical testing for footwear materials.
8.2 Mention the importance and official method for determining chromic oxide content of leather and waste liquor.
8.3 Mention the official method for determining fat content of leather.
8.4 Mention the official method for determining ash content of leather
8.5 Mention the official method for determining nitrogen content of leather.
8.6 State hydrolysis test method for PU materials.

8.7 Mention the restricted substances and state the legislation applicable to footwear materials.

8.8 Describe the official methods for determining azo dyes, chrome VI, formaldehyde, etc restricted substance present in footwear materials.

Practical

1. Find out the official sampling position of leather for both physical and chemical tests.

1.1 Collection of leather.

1.2 Draw layout.

1.3 Identify the sample location.

1.4 Cutting the sample.

1.5 Taking safety precaution.

2. Demonstrate some thumb tests to assess the quality of crust and finished leather.

2.1 Perform key test

2.2 Perform Adhesion test

2.3 Perform looseness test

3. Conduct the official methods for determination of tensile, tear and bursting strength of upper materials.

3.1 Collection of leather

3.2 Cutting of sample piece

3.3 Conditioning the sample

3.4 Performing the test

3.5 Assess the result

3.6 Take safety precaution

4. Determine the flexing strength of upper and lining materials by standard methods.

4.1 Collection of leather

4.2 Cutting of sample piece

4.3 Conditioning the sample

4.4 Performing the test

4.5 Assess the result

4.6 Take safety precaution

5. Perform the standard procedure to determine the adhesion strength of finish film to leather surface and sole bond strength.

5.1 Collection of sample

5.2 Cutting of sample piece according to SOP

5.3 Conditioning the sample

5.4 Performing the test

5.5 Assess the result

5.6 Take safety precaution

6. Conduct the waterproofness test for upper materials.

6.1 Collection of leather
6.2 Cutting of sample piece
6.3 Conditioning the sample
6.4 Performing the test
6.5 Assess the result
6.6 Take safety precaution

7. Determine the water vapour permeability of upper materials.

7.1 Collection of leather
7.2 Cutting of sample piece
7.3 Conditioning the sample
7.4 Performing the test
7.5 Assess the result
7.6 Take safety precaution

8. Perform wet and dry circular rub fastness test for leather upper materials.

8.1 Collection of leather
8.2 Cutting of sample piece
8.3 Conditioning the sample
8.4 Performing the test
8.5 Assess the result
8.6 Take safety precaution

9. Participate slip resistance test for soling materials.

9.1 Collection of sole
9.2 Cutting of sample piece
9.3 Conditioning the sample
9.4 Performing the test
9.5 Assess the result
9.6 Take safety precaution

10. Determine impact resistance of safety toe cap

10.1 Collection of shoe with safety toe cap
10.2 Perform the test
10.3 Assess the result

11. Determine the chromic oxide, fat and ash content of upper leather.

11.1 Collection of sample
11.2 Prepare the sample
11.3 Perform the test
11.4 Assess the result
11.5 Take safety precaution

12. Conduct hydrolysis test for PU soling materials.

12.1 Collection of sample
12.2 Prepare the sample

12.3 Performing the test
12.4 Assess the result
12.5 Take safety precaution

References

1. Society of Leather Technologists and Chemists-Official Methods of Analysis- 1996.
2. Dutta S.S. - An Introduction to the Principles of Physical testing of Leather.
3. O'Flaherty, William. And Roddy-The Chemistry and Technology of Leather, Vol-IV
4. Heidemann E. -Fundamentals of Leather Manufacturing.
5. Dutta S.S. - An Introduction to the Principles of Leather Manufacture.
6. John Arthur Wilson-Modern Practice in Leather Manufacture.
7. Venkatachalam P.S. - Lecture Notes on Leather.

69864	Footwear Production Technology	T	P	C
		0	6	2

OBJECTIVES

- To be able to understand the basic concepts of production technology.
- To be able to prepare job sheet and production specification for production line.
- To be able to plan the plant layout and production.
- To be able to control the cost, stock, quality, purchase and work-in-progress during production.
- To be able to perform the sales order processing.

SHORT DESCRIPTION

This course deals with the essential tasks such as cost control, plant layout, job sheet, production specification, planning, sales order processing etc. need to perform for footwear production in industry.

DETAIL DESCRIPTION

Practical:

1 **Understanding the basic concepts production technology**
- 1.1 Express production and productivity
- 1.2 Express merchandising
- 1.3 Express supply chain management
- 1.4 Express Line balancing
- 1.5 Expresslean manufacture
- 1.6 Express quality control and quality assurance
- 1.7 Express Five S
- 1.8 Express KAIZEN
- 1.9 Express six sigma

2 **Performing cost control**
- 2.1 Design a process to control the material cost of production
- 2.2 Organize a process to control the labor cost for footwear production

3 **Designing plant layout**
- 3.1 Design the shape of production floor for more production
- 3.2 Design the position of machineries for efficient production

4 **Preparing job sheet**
- 4.1 Construct job sheet for cutting department
- 4.2 Prepare job sheet for sewing department
- 4.3 Prepare job sheet for lasting department

5 **Preparingproduction specification**

5.1 Prepare document for style specification

5.2 Prepare document for tooling and materials specification

5.3 Prepare documents for process steps.

6 **Preparingof stock control and purchasing documents**.

6.1 Design a document for stock control

6.2 Construct purchasing documents.

7 **Expressing information for sales order processing**

7.1 Prepare order form for factory order details.

7.2 Construct the mechanism for sales order processing.

8. **Controlling work-in-progress**

8.1 Organize the process to control the First in first out

8.2 Construct the process to maximize machine efficiency

8.3 Construct the process to maximize material efficiency

9. **Planning for production**

9.1 Express forward planning

9.2 Construct weekly planning

9.3 Construct plan for daysheet

10. **Controlling quality in Footwear production**

10.1 Conduct quality control in cutting department

10.2 Conduct quality control in sewing department

10.3 Conduct quality control in lasting and finishing department

References

1. European Organization of Quality Control; Glossary *of Terms Used in Quality Control*. Berne, Switzerland.
2. Juran J.M, Gryna F.M - *Juran's Quality Control Hand Book.* McGraw-Hill Book Company.
3. Ott ; *Process Quality Control..* McGraw-Hill Book Company.
4. Taylor -*Quality Control Systems.* McGraw-Hill Book Company.
5. Juran J. M.- *Juran on Planning for Quality.* The Free Press, New York.
6. UNIDO, Acceptable Quality standards in the Leather and Footwear Industry.

66651 Programming in Java

T	P	C
2	3	3

OBJECTIVES

- To develop knowledge and skill on programming Basics in Java Language.
- To develop knowledge and skill to create, compile, debug & execute a java program.

SHORT DESCRIPTION

Basics of Java Language, Data Structures in Java, Object Oriented Concepts in Java, Build and Packaging Tools, Threading, Generics, Lambda, Collections, I/O operations, networking in Java, Database communication in Java, RMI package, web server in Java, servlet;

DETAIL DESCRIPTION

Theory:

1. Understand the concept of object oriented programming (OOP)

1.1 Describe the software evolution.
1.2 Mention the drawbacks of traditional programming.
1.3 State the terms used in OOP-objects, classes, data abstraction, encapsulation, inheritance, Polymorphism, message passing, and dynamic binding
1.4 Mention the list of OOP languages.
1.5 State the benefits of OOP.
1.6 Mention the application of OOP.

2. Understand the features of Java

2.1 Describe the history of Java.
2.2 Describe Java development environment steps.
2.3 Mention the applications of Java.
2.4 Describe programming style and convention of Java.
2.5 Describe white space, identifiers, literals, comments, separators and keywords of Java.
2.6 Write the structure of Java Program

3. Understand the use of Data types, Variables, Operators, Control Statements and Array in Java

3.1 State the data types (primitives, non-primitive and literals) of Java programs.
3.2 Describe the declaration and dynamic initialization of variables in java.
3.3 State the process of accepting input from a user and option panes
3.4 Describe the control flow statements in Java.
3.5 Describe various types of operators used in Java.
3.6 Describe Array dimensions, declarations and initializations.
3.7 Write Java programs using operators, control statements and Arrays.

4. Understand Classes, Objects, Methods, and Constructors in Java

4.1 Describe the declaration (syntax) of class and object in Java.
4.2 Define Method with syntax.
4.3 State the procedure of adding Method to class.
4.4 Describe the advantages of Method.
4.5 Describe the overloading Method in java.
4.6 Describe the constructor and overloading constructor in java.
4.7 Explain the instance variable hiding, and garbage collection.
4.8 Write java programs relating to class, object, method and constructor.

5. Understand the inheritance and polymorphism

5.1 Define super class and sub class.
5.2 Describe the multilevel hierarchy of inheritance.
5.3 Describe the overridden methods in java.
5.4 Describe dynamic run-time polymorphism in java.
5.5 Describe the abstract and object classes in java.
5.6 Mention the uses of *final* and *super* keyword.
5.7 Write java programs relating to inheritance and polymorphism.

6. Understand Packages and Interfaces

6.1 Define the packages with syntax
6.2 Describe the function of packages
6.3 Mention the different levels of class member access.
6.4 Define the interfaces with syntax.
6.5 Describe the implementation of interfaces.
6.6 Explain the nested interfaces.
6.7 Describe the variables in interfaces.
6.8 Write java programs that related to package and interface.

7. Understand multithreaded programming

7.1 Define multithreaded programming with syntax.
7.2 Mention the different between processed-based and thread-based multitasking
7.3 Mention the several methods of thread class with state diagram.
7.4 Describe the way to create the several types of thread.
7.5 Describe the minimum, default and maximum thread priorities.
7.6 Describe the synchronization inter-thread communication method.
7.7 Describe the suspending, resuming and stopping threads.
7.8 Write java programs using multithreaded programming method.

8. Understanding I/O Operations

8.1 Describe the Byte stream and Character Stream Classes.
8.2 Describe the Reading Console Input and Writing Console Output.
8.3 Mention the constructors for creating File objects.
8.4 Describe the Reading and Writing files in java.
8.5 Describe flowchart of a complete java streams.
8.6 Describe the Random Access File Streams.
8.7 Write java programs relating I/O operation.

9. Database Connectivity: JDBC

9.1 Define Java Database Client/Server methodology.
9.2 Describe Two-Tier and Three-Tier Database Design.
9.3 Describe JDBC API(API Components, Applications and Applets)
9.4 Mention security considerations of JDBC.
9.5 Describe JDBC Drivers, JDBC-ODBC Bridge and Current JDBC Drivers.
9.6 Write java programs relating to JDBC.

10. Client-Server Networking in Java.

10.1 Define network protocol
10.2 Describe TCP and UDP.
10.3 Describe Socket Programming and URL Processing.
10.4 Describe steps occur when establishing a TCP connection between two computers using sockets.
10.5 Describe Server Socket Class Methods (**java.net.ServerSocket)**

PRACTICAL:

1 Install a Java Development Kit /Net beans software
2 Write and execute java program for displaying text messages.
3 Write and execute java programs using arrays and control flow statements.
4 Write and execute java programs using class, object, method and constructor.
5 Compile and run your program using Ant, Maven, Gradle packaging tool in Java.
6 Write and execute java programs using inheritance and polymorphism.
7 Write and execute java programs using package.
8 Write and execute java programs using interface.
9 Write and execute java programs using multithreaded programming method.
10 Write and execute java programs using I/O operation.

REFERENCE BOOKS & URL.

1. The Complete Reference of Java- Herbert Schildt

2. JAVA How to Program- P.J. Deitel and H.M. Deitel

3. সান জাভা - ২ জাহিদ খান; মিন্টু লাল সাহা; জয়ন্ত কুমার সাহা; আব্দুল আহাদ মুরাদ

4. জাভা প্রোগ্রামিং - এএনএম বজলুর রহমান রোকন

Related URL links:

http://www.informit.com/library/content.aspx?b=STY_Java2_24hours&seqNum=24

http://java.sun.com/developer/onlineTraining/JavaIntro/contents.htmlinks

http://www.homeandlearn.co.uk/java/java.html

http://java.sun.com/ : Java Development Kit, Development tools, Java Tutorial

http://www.eclipse.org/ : A vendor-neutral open development platform and application frameworks for building software

http://www.uml.org/: UML resources

http://www.bruceeckel.com/ : Free electronic version of the book

http://www.javatpoint.com/java-tutorial

65853 INNOVATION and ENTREPRENEURSHIP

T	P	C
2	0	2

AIMS

- To be able to understand the concept of entrepreneurship and entrepreneur.
- To be able to understand the concept of environment for entrepreneurship.
- To be able to understand the sources of venture ideas in Bangladesh.
- To be able to understand the project selection.
- To be able to understand business planning.
- To be able to understand the insurance and premium.

SHORT DESCRIPTION

Concepts of entrepreneurship and entrepreneur; entrepreneurship and economic development; environment for entrepreneurship; entrepreneurship in the theories of economic growth; sources of ventures ideas in Bangladesh; evaluation of venture ideas; financial planning; project selection; self-employment; entrepreneurial motivation; business plan; sources of assistance and industrial sanctioning procedure.

DETAIL DESCRIPTION

Theory:

1 Understand the basic concept of entrepreneurship and entrepreneur.

1.1 Define entrepreneurship and entrepreneur.
1.2 Discuss the characteristics and qualities of an entrepreneur.
1.3 Mention the classification of entrepreneur.
1.4 Discuss the necessity of entrepreneurship as a career.
1.5 Discuss the prospect of entrepreneurship development in Bangladesh.

2.Understand the concept of entrepreneurship and economic development.

2.1 Define economic development.
2.2 Discuss the economic development process.
2.3 Discuss the capital accumulation or rate of savings.
2.4 Discuss the role of entrepreneur in the technological development and their introduction into production Process.
2.5 Discuss the entrepreneur in the discovery of new product.
2.6 Discuss the discovery of new markets.

3.Environment for entrepreneurship development:

3.1 Define the micro environment.
3.2 Discuss individual income, savings and consumption.
3.3 Define macro environment.
3.4 Discuss political, socio-cultural, economical, legal and technological environment.
3.5 Difference between micro and macro environment.

4. Understand the facility planning for an entrepreneur:

4.1 Selection of product/service.
4.2 Core competence of product/service.
4.3 product life cycle.
4.4 New product development process.
4.5 Mortality curve of a product.
4.6 Creativity and innovation in product modification/ development.

5. Understand the concept of entrepreneurship in the theories of economic growth.

5.1 Define entrepreneurship in the theories of economic growth.
5.2 Discuss the Malthusian theory of population and economic growth.
5.3 Discuss the stage theory of growth.
5.4 Discuss the Schumpeterian theory of economic development.
5.5 Discuss the entrepreneurship motive in economic development.

6. Understand the sources and evaluation of venture ideas in Bangladesh.

6.1 Define sources of venture ideas in Bangladesh.
6.2 Discuss different types of sources of venture ideas in Bangladesh.
6.3 Define evaluation of venture ideas.
6.4 Discuss the factors that influence the selection of venture idea.

7. Understand the concept of project selection and financial planning.

7.1 Define project.
7.2 Discuss the idea of project.
7.3 Describe the guide lines for project ideas.
7.4 Discuss the sources of project ideas.
7.5 Discuss the evaluation of project ideas.
7.6 Describe the technical aspect of project.
7.7 Define financial planning.
7.8 Discuss the long term financial plan.
7.9 Discuss the short term financial plan.

8. Understand the concept of self-employment.

8.1 Define self-employment.
8.2 Describe different types of employment.
8.3 Describe the importance of business as a profession.
8.4 Discuss the reasons for success and failure in business.

9. Understand the business plan and the concept of the environment for entrepreneurship.

9.1 Define business plan.
9.2 Describe the importance of business plan.
9.3 Discuss the contents of business plan.
9.4 Define environment of business.
9.5 Describe the factors which effect environment on entrepreneurship.

10. Understand the concept of sources of assistance and industrial sanctioning procedure.

10.1 Define sources of assistance.
10.2 Describe different types of sources of assistance.
10.3 Discuss the aid of sources.
10.4 Discuss the industrial policy.
10.5 Define foreign aid.

11 Understand the insurance and premium.

11.1 Define insurance and premium
11.2 Describe the essential conditions of insurance contract.
11.3 Discuss various types of insurance.
11.4 Distinguish between life insurance and general insurance.

Reference book:

1. A hand book of new entrepreneur-by p.c jain.
2.A manual on business opportunity Identification and selection-by j.B patel and S S modi.
3.Uddokta unnoyan Nirdeshika -Md.Sabur khan.
4.Entrepreneurship- bashu and mollik.
5.Business Entrepreneurship-kage faruke.