

Course Name : Diploma in Technical Chemistry
Course Code : DTC
Semester : Sixth
Subject Title : Process House Planning & Control
Subject Code : 135CH61

Teaching and Examination Scheme:-

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		P		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
4	-	-	3	80	32	20	100	40	-	-	-	-	-	--	100

Rationale:

1. The chemical processing of textiles is a part of textile manufacturing process, which has various types of machines, which treat the fabric in stages to give desired properties or finishes suitable for particular use. To get optimum performance of various machines in the section, planned layout of machine is very important.
2. The flow of material and the fluids or chemicals are important, which depends on good lay out of machines and other ancillaries.
3. The material handling is one of the important aspects of manufacturing process.
4. In recent days the pollution of water and air is considered seriously. The processing houses let off lot of polluted water, which if not treated properly would pollute the drinking water severely. The processing technologist should have knowledge of these aspects too.
5. The subject covers the planning of various processes involved in Wet processing of textiles and machines for a given set of conditions. It covers sources and consumption of important materials such as water, steam, power, fuel, etc.
6. The subject includes wage structure, costing and cost control measures. Areas of safety and accident free working also form a part of the subject

Objectives:

The students will be able to:

1. Get the knowledge of construction and planning of dye house.
2. Get the knowledge of production norms for varies stages of processing
3. Study various norms and methods of pollution control.
4. Get the knowledge of material handling and safety in textile industry.

SECTION - I			
S.N.	Contents	Hours Reqd.	Marks Alloted
1	Process House Planning: <ol style="list-style-type: none"> 1. Selection of site for process house for cotton, synthetic processing with ecological aspects. 2. Principles of general layout of building, machinery, fire prevention. 3. Pollution control operations. 4. Preparation of overall plan for layout and construction of building for modern process house. 5. Factors to be considered in section of site/place for modern process house. 6. Sources and consumption of water, steam, power, oils, etc. for the planned production. 7. Material handling equipments. Requirement of staff & labour for planned production. 	16	20

2	Costing and its application to Textiles: <ol style="list-style-type: none"> 1. Costing, its definition and its uses to management. 2. Classification of cost and various methods of costing. Marginal costing and Break even analysis. Standard costing and its applications. 3. Process costing and its applications. 4. Wage structure in textile mills. Depreciation, over-head cost and its absorption in the unit of production 	16	20
SECTION –II			
3	Process Control: <ol style="list-style-type: none"> 1. Definition of quality and process control. 2. Process control measures in bleaching department, quality control aspects of bleached and 2inimize2d fabric, measures to increase the production, reduce the cost of production with reference to water and energy and cost saving. Norms for various stages of bleaching and mercersing. 3. Process control measures in dyeing and printing departments. Measures to 2inimize redyeing, to reduce damages, to reduce cost of production and increase in production. 4. Process control measures in finishing department. 5. Important check list at various processing stages. 	16	20
4	Safety in Textile Industry: Concept and importance of safety measure in textile industry with special emphasis on processing department. Factors responsible for accidents in textile mills. Factors to be considered for accident free working e.g. flooring, machine, lightness, drainage, maintenance, awareness of safety among workers, storage system of various chemicals, safety in transportation. Different chemicals used in wet processing and their safe handling.	16	20
	TOTAL	64	80

Learning Resources:

Text Book

1. Dye-House Management Edited by John Shore Published by Society Of Dyers & Colorists 2000

Reference Book:

1. Cost Accounting in Textile Mills P.V.Bhave and V.Shrinivasan first reprint 1997
2. Norms for the textile Industry BTRA publication 2000
3. Industrial Engg & Management Dr. O.P. Khanna Dhanpal Rai & sons 2000 New Delhi
4. Business Administration & Management Dr. S.C. Saksena Sahitya Bhavan Agra
5. The process of Management W.H. Newman E.Kirby Warren Andrew R. McGill Prentice- Hall of India Pvt. Ltd. New Delhi - 110001

Course Name : Diploma in Technical Chemistry
Course Code : DTC
Semester : Sixth
Subject Title : Chemistry, Applications & Testing of Textile Auxiliaries
Subject Code : 135CH62

Teaching and Examination Scheme:-

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		P		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
4	-	-	3	80	32	20	100	40	-	-	-	-	-	--	100

RATIONALE:

1. Like any other textile manufacturing processes chemical treatment of textiles involves the use of raw material, men, money, and machine with lot of other things. As such, the processes in the chemical processing must be managed to give the best performance with respect to production, quality, and the cost of production. In today's competitive world it is very essential to achieve very high standards of quality of the finished product. Therefore the testing of raw material (textiles and chemicals), intermediate products, and the final product becomes important aspect of the process.
2. This subject intends to impart the knowledge and skill to the students in this area.

Objectives:

The students will be able to:

1. Get the knowledge of various tests of dyes
2. Get the knowledge of various tests of auxiliaries (Used for pretreatment, dyeing, printing and finishing)
3. Get the knowledge of testing of textile after processing.
4. Get the knowledge of quality control norms.

SECTION - I			
S.N.	Contents	Hours Reqd.	Marks Alloted
1	General considerations, Definition of Textile Auxiliaries. Nomenclature, Functions & Classification of Textile auxiliaries.	05	08

2	<p>Surfactants / their chemistry and applications. Definition & classification of surfactants, mechanism of the action of surfactants/surface active agents. Basic properties such as Cloud point, Critical Micelle Concentration (CMC), Solubility, Hydrophilic Lypophilic Balance (HLB) etc. Essential requirements of good SAA. Importance of HLB value and its influence on properties of SAA. Preparation, properties & chemistry of TRO.</p> <p>Anionic Surfactants : preparation, properties & uses of anionics from carboxylic acids, alkylaryl sulphonates, alkyl sulphates, alkane sulphonates and phosphate esters, etc.</p> <p>Preparation, properties and uses of Cationic surfactants from fatty amines, ethoxylated fatty amines, quaternary ammonium compounds.</p> <p>Preparation, properties and uses of Nonionics surfactants from polyoxyethylene ethers of fatty alcohols, polyoxyethylene ethers of alkyl phenol, polyglycol thioethers, polyglycol fatty acid esters, etc.</p> <p>Biodegradability of surfactants. Evaluation & testing of various types of surfactants used in textile processing.</p>	16	20
3	<p>Chemistry & applications of</p> <ul style="list-style-type: none"> • Dyefixing agents, • Wetting agents, • Levelling agents & Retardants, • Defoaming agents & Swelling agents. • Dispersing agents & Antimigrating agents, • Proofing agents. • Study of various auxiliaries used in Desizing, Scouring, • Bleaching, Mercerizing, Dyeing, Printing & Finishing processes 	11	12
SECTION – II			
4	<p>Methods of Evaluation of Textile Auxiliaries and use of various equipments:</p> <ul style="list-style-type: none"> • Qualitative & Quantitative evaluation of : • Wetting agents. • Detergency 	20	24

	<ul style="list-style-type: none"> • Wettability of textiles. • Levelling agents. • Cross linking agents. • Optical whitening agents. • Water repellents. • Flame retarding agents. • Soil release agents. • Anti-static agents. • Anti-pilling agents. • Binders. 		
5	Principle & application of thin layer chromatography. Paper chromatography, Gas liquid chromatography, Infra-red spectroscopy, NMR used in analysis of textile auxiliaries.	06	08
6	Recent developments in textile auxiliaries with ecofriendly concept. Speciality auxiliaries used in Garment processing. Red list chemicals, banned amines.	06	08
	TOTAL	64	80

Learning Resources:

Text Book

1. Chemistry of textile Auxiliaries By V A Shenai Sevak Publications edition 2000

Reference Books:

1. Chemistry of Organic Textile Chemicals—Dr.V.A.Shenai & Dr.N.M.Saraf (Sevak Publications)2000.
2. Colorant and Auxiliaries Vol 2 - John Shore Published by SDC 1995 UK
3. Evaluation of Textile Chemists Vol.VIII – Dr.V.A.Shenai (Sevak Publications) 1999

Course Name : Diploma in Technical Chemistry
Course Code : DTC
Semester : Sixth
Subject Title : Technology of Finishing -II
Subject Code : 135CH64

Teaching and Examination Scheme:-

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		P		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
4	-	-	3	80	32	20	100	40	-	-	-	-	-	-	100

RATIONALE:

Fabrics are finished to give them final face uplift so as to increase attractiveness & serviceability along with certain desirable properties. With the rise in demand by the consumers, speciality finishes are applied to improve their marketability. The subject also deals with various finishing chemicals, methods of applications and machineries.

OBJECTIVES:

The students will be able to:

1. Get the knowledge of mechanical and chemical finishes
2. Get the knowledge of different finishes applied on textile fabric.
3. Get the knowledge of garment finishing
4. Study the recent finishes for textiles
- 5.

No	Section I	Lectures	Marks
1	Finishing of synthetic fabrics: Heat setting- Definition, purpose, objects, types, conditions, medium of heat setting. Anti-pilling finish- Introduction, factors influencing, treatment types. Antistatic finish- Introduction, chemicals used, methods of applications. Soil release finish- purpose, requirements, governing factors, methods and process, Weight reduction of polyester-Shiffon finish.	12	15
2	Finishing of wool and silk: Milling- Introduction, classification, requirements, types and advantages and disadvantages. Crabbing- Object, method, parameters, machine. Decatising- Introduction, mechanism, parameters, machine, chemical decatising. Antifelting , Rotary press. Weighting of silk.	12	15
3	Finishing of knit goods: Stone wash finish, Peach skin finish, dimensional stability of knit garment, Finishing of garments from Denim. Silicone softner for knit garments.	8	10

Section-II			
4	Developments in environment friendly functional finishes: Easy care / wrinkle free finishes, pre and post cur process, finishing in garment form, dip process, tumble process, chemicals used, important precautions, quality control. Eco-friendly cross linking agents,	9	11
5	Functional finish of garment for specific end use: Medical applications, space applications, military and defense applications, sports applications,	6	8
6	Foam finishing: Definition of foam and blow ratio, stability of foam, methods to prepare foam, factors affecting stability of foam, methods to determine stability of foam, various methods of foam application.	8	10
7	Recent development in finishing, moisture management finishes, oil repellent finish, UV protective finishes, bio-polishing finish.	9	11
Total		64	80

Learning Resources:

Text Book

1. Technology Of Finishing Vol X By V A Shenai Sevak Publications Edition 2000.
2. Textile Preparation and Dyeing Asim kumar Roy Chaudhary Oxford & IBH Publishing Co Pvt Ltd.2006 New Delhi

Reference Books

1. Textile Finishing By Derek Heywood Society Of Dyers & Colorists 2000.

Course Name : Diploma in Technical Chemistry
Course Code : DTC
Semester : Sixth
Subject Title : Technology of Garment Processing and Analysis
Subject Code : 135CH65

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		P		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
4	-	-	3	80	32	20	100	40	-	-	-	-	-	-	100

RATIONALE:

1. The latest trend is a high demand for Ready Made Garments both locally and globally. The subject deals with the processing of garments as well as the study of various properties required by fabrics used by garment manufacturers.
2. Different aspects of garments to suit International standards are also dealt with.
3. Fabrics processed require Analysis and Testing for the production of consistent quality goods.
4. In order to ensure final fault free processed fabrics, it is essential to check the quality at every stage of processing.
5. The subject of Analysis and Testing of Processed goods deals with methods for the evaluation of processed fabric at different stages of wet processing.

Objectives:

The students will be able to:

1. Get the knowledge of garment manufacturing.
2. Get the knowledge of processing of various types of garments and the machinery involved.
3. Get the knowledge of testing of textile garments after processing.
4. Get the knowledge of quality control norms.

SECTION - I			
S.N.	Contents	Hours Reqd.	Marks Alloted
1	Introduction to garment processing. Identification of different types of garments.	02	02
2	Classification of garments based on 100% cotton, 100% wool, 100% synthetics, 100% silk, blends of above, Knitted fabrics.	02	02
3	Garment dyeing machines. Various garment washing machines used in industries.	06	08
4	Garment finishing. Finishing of garments made from Woven, Denim, Knit fabrics. Role of enzyme to produce novel effects.	06	08
5	Garment finishing machinery and development.	06	08
6	Quality & process control during garment processing.	03	04
7	Emerging technologies & trends in garments.	03	04

8	International standards for specific end use of garments.	04	04
SECTION - II			
09	Functional finishing of garments for specific end use. Quality control & testing of finished garments based on international standards.	08	10
10	Identification of different stains on garments and special techniques used for their removal. Uses of various stain removers, etc	03	04
11	Care of seam (stitching) & the garment quality used in garment constructive effect on processing. Care labelling of various garments and its significance. Causes of stitch damage. Garment comfort.	05	06
12	<p>ANALYSIS OF PROCESSED GOODS</p> <p>Objects of testing.</p> <p>Grey fabric and its evaluation to achieve corrective action and preventive measures.</p> <p>Estimation of size content, wax content, noncellulose matter, whiteness, absorbance at various stages of processing.</p> <p>Assessment of chemical damage during processing, estimation of hydrocellulose and oxycellulose. Estimation of scouring loss.</p> <p>Colour fastness standards. Colour fastness of textiles to different agencies such as washing, light, rubbing, hypochlorite bleaching, peroxide bleaching, perspiration, gas fumes, etc.</p> <p>Study, assessment and remedies of following:-</p> <p>Bleaching defects, dyeing defects, printing defects, finishing defects.</p> <p>Types of stains produced on fabric (Grey stage) and process to minimize it and their removal by chemical means.</p>	16	20
	TOTAL	64	80

Learning Resources:

Text Book

1. Garment Processing – R.M.Mittal, [ATIRA Publication] 2000.

BOOKS FOR REFERENCE:

1. An Introduction to Quality Control for the Apparel Industry- P.V.Mehta [ASQC Quality Press, Marcel Dekkar, Inc., HongCong.]
2. Garment Dyeing : Edited by P.W.Horrison, [The Textile Institute, Textile Progress Series Vol 19, No.2].
3. Garment Finishing of Knits-Book Of Papers-NCUTE-PLIOT PROGRAMME at VJTI-Sept-01.
4. Fabric Care – Noemia D'Souza (New Age International (P) Ltd.Publication 1997.
5. Towards Zero Defects- Ambubhai Patel[Meena Publisher-Ahmedabad 1995]

COURSE NAME: Diploma in Technical Chemistry.
COURSE CODE: DTC
SEMESTER : Sixth
SUBJECT TITLE: Dye House Practical
COURSE CODE: 135CH66

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		P		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
-	-	6	-	-	-	-	-	150	60			50	20	200	

RATIONALE:

Experiments are based on Chemistry & Applications & Testing of Textile auxiliaries, Technology of Garment Processing & Analysis of Processed goods and Technology of Printing – II

OBJECTIVES:

The students will be able to:

1. Get the knowledge of mechanical and chemical finishes
2. Get the knowledge of different styles of printing on synthetic textile fabric.
3. Get the knowledge of garment finishing
4. Study the recent finishes for textiles

COURSE CONTENTS:

1. Experiments based on Chemistry & applications & Testing of Textile auxiliaries. Preparation and qualitative and quantitative evaluation of auxiliaries e.g. stain remover, dye fixing agent, resin, stiffener, binder, etc.
2. Analysis of different types of garments for end uses. Dyeing of garments with selected dyes.
3. Testing and Analysis of bleached, dyed and printed goods for end use as per International standards ie. testing of all types of fastness properties.
4. Analysis of specialized printing auxiliaries used in cotton and manmade fabric printing.
 - a. Printing of blended fabrics.
 - b. Printing of cotton & synthetics for discharge and resist style of printing.
 - c. Printing of nylon, wool, silk and others for direct, discharge and resist styles of printing.
 - d. Miscellaneous styles of printing such as Batik style, Khadi printing, Brasso style, etc.
5. Printing of natural dyes on polyester, wool, silk, etc.
6. Analysis of effluents of textile process house and study of prescribed norms, etc.
7. Experiments based on colour computer matching (CCM) system. Recipe prediction, standardization, etc.
8. Evaluation of banned dyes, chemical and auxiliaries with use of instrumentation techniques (demonstration experiment).

Reference Books:

1. Analysis of Textile Chemicals - N.F.Desai [Colourage Publication]2000
- 2 Principle and practices in Dyeing - V.A.Shenai Shenai Sevak Publications Fifth Edition
1999

Course Name : Diploma in Technical Chemistry
Course Code : DTC
Semester : Sixth
Subject Title : Environmental Aspects of Textile Industry
Subject Code : 135CH63
Teaching and Examination Scheme:-

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		P		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
4	-	-	3	80	32	20	100	40	-	-	-	-	-	--	100

Rationale:

- The chemical processing of textiles is a part of textile manufacturing process.
- In recent days the pollution of water and air is considered seriously. The processing houses let off lot of polluted water, which if not treated properly would pollute the drinking water severely. The processing technologist should have knowledge of these aspects too.
- Understanding German ban. Red list chemicals.
- Introduction to toxicity.
- The material handling is one of the important aspects of manufacturing process. Areas of safety and accident free working also form a part of the subject
- The subject covers the ecofriendly processing of textiles and machines for a given set of conditions. It covers sources and consumption of important materials such as water, steam, power, fuel, etc.

Objectives:

The students will be able to:

Get the knowledge eco-system.

Get the knowledge of pollution norms for .

Study various methods of pollution control.

Get the knowledge of material handling and safety in textile industry.

- 1) Material handling equipments & methods.
 - 2) Accidents and their causes in textile industry.
 - 3) Importance of flooring, machinery, lighting, drainage & maintenance for safety.
 - 4) Awareness of safety.
- Storage, transportation, and handling of different chemical used in wet processing and their safety measures.

SYLLABUS

SECTION - I			
S.N.	Contents	Hours Reqd.	Marks Alloted
1	<p>Introduction to concept of pollution</p> <ul style="list-style-type: none"> • Factors affecting environment. • definition of environment • Definition of pollution, Different types of pollution. • Pollution and health • Effects of dyes, chemicals, pH, temperature on quality of water and its surroundings. • Quality and quantity and norms of effluent generated from various unit operations of wet processing. • Measures to reduce the effluent load. • Testing of effluent for BOD, COD & TDS. • Basic considerations in designing of an effluent treatment plant. • Introduction to primary, secondary & tertiary treatments of effluents. 	18	30
2	Introduction to laws and regulations for pollution	5	10
SECTION –II			
3	Introduction to toxicity.	5	10
4	<p>Understanding German ban</p> <ul style="list-style-type: none"> • Methods of analysis and estimation of banned chemicals. 	10	15
5	<p>Ecofriendly processing practices.</p> <p>Safety in Textile Industry:</p> <p>Concept and importance of safety measure in textile industry with special emphasis on processing department. Factors responsible for accidents in textile mills. Factors to be considered for accident free working e.g. flooring, machine, lightness, drainage, maintenance, awareness of safety among workers, storage system of various chemicals, safety in transportation. Different chemicals used in wet processing and their safe handling.</p>	10	15
	TOTAL	48	80

List of reference books :

Sr No.	Name of book	Publication & Author
1	Toxicity of Dyes & Intermediates	Mirachem Industries Dr. V A Shenai
2	Ecology & Textiles	Sevak Publication V A Shenai
3	Environmental Studies	Technical Publications Dr Dinesh K Gupta
4	Environmental Studies	University Science Press Dr J P Sharma

COURSE NAME : Diploma in Technical Chemistry
COURSE CODE : DTC
SUBJECT TITLE : Industrial Project
SEMESTER : Sixth
COURSE CODE : 135CH67

Teaching and Examination Scheme:-

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		P		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
-	-	3	-	-	-	-	-	-	-	-	25	10	25	10	50

Rationale :-

To apply the principles learnt during course.

Objective :-

- Students do literature survey in the given topics.
- Students start applying the principles learned in course and develop the independent decision making.
- They are able to analyze the case and think of alternate recipes to get desired result.
- They are able to prepare seminar and presentation to present the results.

VI sem Dyeing / printing practicals

Practical: printing

Skills to be developed:

Intellectual skills:

- 1) Understand screen preparation.
- 2) Understand printing process.
- 3) Learn different styles of printing.

Motor skill:

- 1) Drawing a design & prepare screen of same.
- 2) Discharge & resist style of printing.

List of Practicals:

- 1) Preparation of screen for printing
- 2) Batick style of printing
- 3) Tie & dye style of printing
- 4) Magic style of printing, crimp style of printing
- 5) White & colour discharge on cotton using direct and reactive dyes
- 6) White & colour discharge on cotton using vat dyes
- 7) Azoic colour discharge printing on direct dyed ground
- 8) White & colour resist style of printing on cotton
- 9) Silk printing with acid dyes

LIST OF EXPERIMENTS finishing

1. Preparation and application of Blue Tone and Red Tone on cellulosic.
2. Preparation and application of Blue Tone and Red Tone on synthetic and its blends.
3. Application & evaluation of various types of softeners on cotton.
4. Application & evaluation of various types of softeners on polyester and its blends.
5. Finishing of cotton for imparting soft, medium and stiff handle.
6. Resin finishing of cotton.
7. Application of OBA on cotton and polyester by continuous & exhaust method.
8. Finishing of wool to impart moth proofing.
9. Finishing of Silk to impart crease recovery property.
10. Application & evaluation of anti microbial finish on cotton.
11. Application & evaluation of flame retardant finishing on cotton.
12. Application & evaluation of waterproof / Water repellent Finishing on cotton
13. Biopolishing of cotton.

List of Practicals:

- 1) Preparation of screen for printing
- 2) Batick style of printing
- 3) Tie & dye style of printing
- 4) White & colour discharge on cotton using direct and reactive dyes
- 5) White & colour discharge on cotton using vat dyes
- 6) Azoic colour discharge printing on direct dyed ground
- 7) White & colour resist style of printing on cotton
- 8) Silk printing with acid dyes

LIST OF EXPERIMENTS finishing

1. Preparation and application of Blue Tone and Red Tone on cellulosic.
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3. Application & evaluation of various types of softeners on cotton.
4. Application & evaluation of various types of softeners on polyester and its blends.
5. Finishing of cotton for imparting soft, medium and stiff handle.
6. Resin finishing of cotton.
7. Application of OBA on cotton and polyester by continuous & exhaust method.
8. Finishing of wool to impart moth proofing.
9. Finishing of Silk to impart crease recovery property.
10. Application & evaluation of anti microbial finish on cotton.
11. Application & evaluation of flame retardant finishing on cotton.
12. Application & evaluation of waterproof / Water repellent Finishing on cotton
13. Biopolishing of cotton.

Course Name : Diploma in Technical Chemistry

Course Code : DTC

Semester : Sixth

Subject Title : Student Centered Activity/Test

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		PR		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	

Rationale:–

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Expert lectures, E-learning sources, E-library, Internet, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Objectives:

The Student will be able to:

1. Acquire information from different sources
2. Prepare notes for given topic
3. Present given topic in a seminar
4. Interact with peers to share thoughts
5. Take the advantages of E-learning sources