



ANNAMALAI UNIVERSITY

B. Sc. (FIRE AND INDUSTRIAL Safety)

REGULATIONS AND SYLLABUS

Copyright Reserved
(For Private Circulation Only)

B. SC. (FIRE AND INDUSTRIAL SAFETY)

REGULATIONS AND SYLLABUS

Objectives

The Bachelor of Science – Fire & Industrial Safety Programme is to reach over the youth of the country by eradicating the disasters and offering them bright career opportunities in fire and industrial safety which is grasped, has the potential to change their life for the betterment within the course period of enrollment.

Duration The Programme

The duration of the programme of study is Three years and students shall complete the programme within a period of 7 years from the year of admission and the programme will comprise the subjects given in regulations.

Medium of Instruction

English will be the medium of instruction for the programme.

Eligibility for Admission

10th + 2 or I.T.I (2 years) or Equivalent

Course Contents

First year

- Part – I Language: (01) Telugu or (02) Hindi or (03) Tamil or (04) Malayalam or (05) Kannada
- Part – II English Prose and Composition
- Part – III Fundamentals of Fire & Safety
- Part – III Safety Engineering
- Part – III Safety in Construction Industry
- Part – III Practical Viva – Voce on Industrial Safety

Second Year

- Part- I Language: (01) Telugu or (02) Hindi or (03) Tamil or (04) Malayalam or (05) Kannada
- Part- II English Poetry and Drama
- Part – III Fire Engineering
- Part – III Environment & Pollution
- Part – III Industrial Hygiene and Occupational Health
- Part – III Practical Viva – Voce on Fire Fighting

Final Year

- Part – I Safety & the Law
- Part – II Safety Management
- Part – III Safety in Chemical & Electrical Industry
- Part – IV Fundamentals of Disaster Management
- Part – V Dissertation and Viva

Scheme of Examinations

The total marks for each course is 100. There will be two examinations each year, one regular, one supplementary.

Course	Subjects	Duration	Max. Marks	Min. Marks for a Pass
FIRST YEAR				
Part – I	Language: (01) Telugu or (02) Hindi or (03) Tamil or (04) Malayalam or (05) Kannada	3 hours	100	40
Part – II	English: Prose and Composition	3 hours	100	40
Part – III	Fundamentals of Fire & Safety	3 hours	100	40
Part – III	Safety Engineering	3 hours	100	40
Part – III	Safety in Construction Industry	3 hours	100	40
Part – III	Practical Viva – Voce on Industrial Safety	3 hours	100	50
SECOND YEAR				
Part – I	Language: (01) Telugu or (02) Hindi or (03) Tamil or (04) Malayalam or (05) Kannada	3 hours	100	40
Part – II	English: Poetry and Drama	3 hours	100	40
Part – III	Fire Engineering	3 hours	100	40
Part – III	Environment & Pollution	3 hours	100	40
Part – III	Industrial Hygiene and Occupational Health	3 hours	100	40
Part – III	Practical Viva – Voce on Fire Fighting	3 hours	100	50
FINAL YEAR				
Part – I	Safety & the Law	3 hours	100	40
Part – II	Safety Management	3 hours	100	40
Part – III	Safety in Chemical & Electrical Industry	3 hours	100	40
Part – IV	Fundamentals of Disaster Management	3 hours	100	40
Part – V	Dissertation and Viva	3 hours	100	50

Passing Requirements

A candidate passing in all subjects will be classified as follows

	Marks	Classification
a	50% and above but less than 60%	Second Class
b	60% and above, but less than 75%	First Class
c	75% and above	First Class with Distinction

A candidate will be declared to have passed the examination in First Class or First Class with Distinction if he/she has passed all the courses in the first appearance and obtained an aggregate of not less than 60 or 75% of marks respectively.

B. SC. (FIRE AND INDUSTRIAL SAFETY)

REGULATIONS AND SYLLABUS

FIRST YEAR

Course Contents

- Part – I Language: (01) Telugu or (02) Hindi or (03) Tamil or (04)
Malayalam or (05) Kannada
- Part – II English Prose and Composition
- Part – III Fundamentals of Fire & Safety
- Part – III Safety Engineering
- Part – III Safety in Construction Industry
- Part – III Practical Viva – Voce on Industrial Safety

SYLLABUS
B. SC. (FIRE AND INDUSTRIAL SAFETY)
PART – I
Language: (01) Telugu
Course-I.1: PROSE AND POETRY
FIRST YEAR

POETRY

1. Hamsa Kaakityoopaakhyaanamu : Tikkana Somayaji
2. Rukmani Kalyanamamu : Bammera Pothana
3. Annmacharya Sankiirthanalu : TenSankirthanas

PROSE

1. Toli Telugu Prabhandhamu : Prof. T. Kodandaramaiah
2. Telugu Tamila Sahityala Sambandhaalu : Prof. C. Radha Krishna Sarma
3. Bharatidasan, tripuraneeni, SriSri : Prof. K. Sarvottama Rao
4. Digamba Kavityam : Prof. N. Bhaktavatsala Reddy
5. Sahityamloo striila pani bhaavanaa : Prof. Katyayani Vidmahe
Pratiphalanaalu
6. Cilukuri Narayana Rao : Prof. G. S. Mohan
7. Yakshaganam : Prof. G. Damodara Naidu
8. Dalitha pratiikalalu : Dr. K Sanjiva Rao

PART – I
B. Sc. (FIRE AND INDUSTRIAL SAFETY)
Language: (02) HINDI
Course-I.1: PROSE AND POETRY
FIRST YEAR

PROSE

1. Gadya Manjusha, Ed. Govind, Amar Prakashan, Mathura

POETRY

1. Kavya Tharang, Ed, by Dr. Niranjana, published by Jawahar Pustakalaya, Sadar Bazaar, Mathura, (U.P.) – 281001.

PART – I
B. Sc. (FIRE AND INDUSTRIAL SAFETY)
Language: (03) Tamil
COURSE-I.1: PROSE AND POETRY
FIRST YEAR

- 1) Saiulum Elikinamam seutt kowai – Annamalai Palgolaik – Kalaga velidu

Erandamandu

- 1) Oreinadaum Nadakamum 1. A.Madhavaiya – Su. Venkatraman
Oreinadai 2. Kamar – Dr Vasudha Manikam
Nadagam 1.Kaiyyart Kanni-Dr Kuway-Balasubramanyam
- 1) Tamil Elekiyyar Varalaru Todakakalan mudal Ekalam varai (Parreinulgul)
1.Tamil Elakiye varalaru (Eru PAgangal – kasu pella)
2.Tamil elakiyya Varalaru (Dr. Muwa Sakithtiyyar Academy veliudu.

Sanga Elekiyam : Mrutchangangal etutugai, pattupatu
Nidielekiyyam : Padian Kilkanaku Nulgul.
Copyangle : Perunkapiangle, siru kapiangle, ramayanam, periyye puranam.

Baktielekiangle : Nalaerthi viappirapandam, panneru tiru muraigal
Uraiasriyagal : Elempuranar, Nachinarkiniyyar, adiarku nalar, manakkudarar, parimalairafar,siranyana munirar.

Pirthupalath Tamilppularorgal : Pattinartor,Arunagirinagar, tayumanorar, eramalinyandigal, arumuganaralar, uway swaminadayor, paridi matkalainar, pandi tamani mu kabiresan chettigyor, tiru vila S Via puri pillai, vibulanda adigal.

TarkalTamil : Nadakam, Padinam, Sirukadai, Karidai, urainadai.

PART – I
B. Sc. (FIRE AND INDUSTRIAL SAAFETY)
Language: (04) Malayalam
COURSE-I.1: PROSE AND POETRY
FIRST YEAR

PROSE

1. Bharatha paryatanam by **Kuttikrishan Marar**
(Lessons 1 to 6 only Published by Marar Sahitya Prakasam about 90 pages)

- a. Bheeshmaprathigna
- b. Amba
- c. Karnnante Arengettam
- d. Udhathinte Audhasala
- e. Bheeshmarute Dharmmanichayam
- f. Nese Balasyeeti Charadadharmmam

POETRY

1. Kavyamala Published by **University of Kerala**
(First 8 poems only)

- a. Kaliyachan - P. Kunhiraman Nair
- b. Pengal - Idassery Govindan Nair
- c. Mazhuvinte Katha - Balamaniamma
- d. Sahyante Mahan - Vailoppilli Sreedharamenon
- e. Himalayan Panayam - Chemmanam Chacko
- f. Saphalamee Yathra - N. K. Kakkad
- g. Kasabianka - K. Ayyappa Panikkar
- h. Ambalamani - SugathaKumari

PART – I
B. Sc. (FIRE AND INDUSTRIAL SAFETY)
Language: (05) Kannada
COURSE-I.1: PROSE AND POETRY
FIRST YEAR

PROSE

Kannada Short Story

Kiragoorina Gayyaligalu by K. P. Poornachandra Tejasvi. Pustaka Prakashana, Mysore, (Chapters: Kiragoorina Gayyaligalu, Krushnegowdana Aane, Maayamruga, Rahasya Vishva)

POETRY

A representative collection of old and medieval Poetry about 100 pages – General understanding and appreciation of poetry, beauty, the language of poetry etc.

Prescribed Text:

Praacheena Kaavya Maarga – Vol 2, Edited by G.S. Siddhalingaiah & A.R. Mitra, 1999, Prasaranga, Bangalore University, Bangalore – 56.

1. Kavi-Kaavya Chintana
2. Saamanyame bageye Bhavthkesha pasha prapancham
3. Pavithramathimabbeya charitham
4. Vaishampaayana Gili
5. Nalakoobara prasanga
6. Vachana Sangraha
7. Kumbaara Gundayyana Ragale
8. Chandramathi Vilaapa
9. Athmangavudu Kurupu
10. Hagegalanu Hindidanu manadolage
11. Goraksha Prasanga
12. Mullidida maraneridanthaadudu
13. Kiruverala Sate.

PART – II

B. Sc. (FIRE AND INDUSTRIAL SAFETY)

COURSE - I.2 – ENGLISH

PROSE AND COMPOSITION

FIRST YEAR

I. Prose texts for Detailed Study:

1. Reader;s Delight : An Anthology of Twentieth Century Prose, Ed. By R. Sundara ZRaju, The National Publishing Co., Madras.
2. Prose in Practice: Ed. By K.P.K. Menon, Macmillan & Co., Madras.

II. General Study:

1. Inspiring Lives: Ed. By Dr. G. Nageswara Rao, Emerald Publishers, 1982.
2. Stories from the East and the West: Ed. By Dr. R. Ganapathy, Emerald Publishers, 1982.
3. Great Expectations: Charles Dickens.

III. Precise Writing

1. Usage: (i) Change of Voice, (ii) Reported Speech, (iii) Degrees of Comparison, (iv) Use of Articles, Prepositions, etc. (v) Correction of Sentences.

PART – III

B. Sc. (FIRE AND INDUSTRIAL SAFETY)

COURSE-I.3: Fundamentals of Fire & Safety

FIRST YEAR

Unit – I

Chemistry of Combustion, Chemistry of Heat & Fire Mechanism, Modes of Fire Extinction, Fire Triangle and Fire Tetrahedron, Classification of Fire, Fire Prevention Techniques, Safe Guards against Fire Risk.

Unit – II

Portable Fire Fighting Appliances, Fixed Fire Fighting Systems, Hose and Hose fittings, pumps & primers, IC Engine, Tank Cooling System Foams and Foam Making Equipment, Fire Alarm System.

Unit – I

Fundamentals of safety, Accidents, causes, classification, Investigation reports, preventive action

Unit – II

Work permit systems – Types of permit with details of each, Personal Protective Equipments, Hazard Analysis.

Unit – III

Risk Assessment, Emergency Control Plan – Safety Policy, Proper usage & maintenance of tools, Industrial psychology.

Reference Books

1. Industrial Safety Health and Environmental Management system Publication: Khanna Publishers, Authors: R.K Jain and Sunil S. Rao
2. Industrial Safety Management Publication: Tata Mc Graw-Hill Publishing Company Ltd. Author: L. M. Deshmukh
3. ABC of Industrial Safety Remember ABC Publication: MEEDS Author: V P M Mani.
4. Fire Protection Hand Book – Publication: National Fire Protection Association USA Author: Quincy – Massachusetts
5. Fire and explosion Hazards Handbook of Industrial Chemicals Publication: Jaico Publishing House Author: Tatyana A. Devletshina & Nicholas P. Cheremisinoff, Ph. D.

PART – III

B. Sc. (FIRE AND INDUSTRIAL SAFETY)

COURSE-I.4: SAFETY ENGINEERING

FIRST YEAR

Unit-I

Introduction to Safe Guarding Machinery, Principles of machine guarding; Ergonomics of machine guarding; Type of guards; Work place design; improving safety and productivity through work place design;

Unit-II

Plant Layout and Design, Safety and Good House Keeping – 5S House Keeping Improve method, important standards and codes practice for plant and equipment, Road safety.

Unit-III

Purpose of lighting, advantages of good illumination, lighting and safety; lighting and the work; sources and types; principles of good illumination; minimum standards of illumination; design, maintenance of lighting.

Unit-IV: Ventilation & Heat Control

Purpose, thermal environment and its measurement; physiology of heat regulations; indices of heat stress; control of heat exposures; control at source; insulation; local exhaust ventilation; control of radiant heat; dilution ventilation.

Unit-V

Effects of noise on man; measurement and evaluation of noise; vibration damping, isolation, absorption, silencers, case studies; Chemical Safety- Hazards/Risks, Safety measures, Confined Space – Hazards/Risks, Safety measures

Reference

- 1) Introduction Ergonomics, WHO by Singleton
- 2) Industrial Safety hand Book, Mc Graw Hill by Handley
- 1) Principle of exhaust ventilation by HMSO

PART – III

B. Sc. (FIRE AND INDUSTRIAL SAFETY)

COURSE-I.5: SAFETY IN CONSTRUCTION INDUSTRY

FIRST YEAR

Unit-I

Introduction to Construction Safety, Excavation – types, hazards involved safety measures, check lists, piling, and concreting, safe means of access.

Unit-II

Introduction to Fabrication yard – hot works hazards associated and safe measures for the following jobs (welding, drilling, grinding, gas cutting and sand blasting).

Unit-III

Introduction to work at height – Advantages and disadvantages, scaffold erection – types, hazards involved, safe measures while working, ladder construction – types, hazards involved, safe measures.

Unit-IV

Introduction material handling – manual handling - hazards associated, safe measures, mechanical handling – hazards associated, safe measures, equipments used (Ropes, chains, hooks, crane and fork lifts etc.)

Unit-V

Introduction to Tools – Hand Tools – Risks associated, safe practices, Power Tools – Risks associated safe practices, care and maintenance, prerequisites.

Reference Books

- 1) ABC of Industrial Safety Remember ABC Publication: MEEDS Author: V P M Mani.
- 3) Electrical Safety, Fire Safety Engineering and Safety Management– Rao.S
- 2) Hand Book of Construction Safety Practices, Bureau of Indian Standards, New Delhi, 2001.
- 4) Construction Safety – Publication: Prentice Hall- Author: Jimmie Hinze, 1997.

PART – III

B. Sc. (FIRE AND INDUSTRIAL SAFETY)

Course – I.6: Practical Viva – Voce on Industrial Safety FIRST YAER

Part A

Record Book: Contains the following topics

1. Write-up on PPE's required for Grinding from the Lab and explain them.
2. Write-up on PPE's required for Welding from the Lab and explain them.
3. Write-up on PPE's required for Gas Cutting from the Lab and explain them.
4. Write-up on PPE's required for Sand blasting from the Lab and explain them in brief.
5. Write-up on PPE's required for drilling from the Lab. Explain them in brief how they are used.
6. Draw scaffolding and label the parts and explain them briefly from the sample scaffold structure.
7. Write-up on various types of ropes and their usage.
8. Write-up on picture of crane, its usage in the industry and explain them in brief.
9. Write-up on required safety items for working at height and explain their advantages and disadvantages.

Part B

Written test on the above mentioned topics

Part C

Identify the displayed Equipments

1. Handling procedure of ALL type of PPEs.

Part D

Viva-voce

B. SC. (FIRE AND INDUSTRIAL SAFETY)

REGULATIONS AND SYLLABUS

SECOND YEAR

Course Contents

- Part- I Language: (01) Telugu or (02) Hindi or (03) Tamil or (04)
Malayalam or (05) Kannada
- Part- II English Poetry and Drama
- Part – III Fire Engineering
- Part – III Environment & Pollution
- Part – III Industrial Hygiene and Occupational Health
- Part – III Practical Viva – Voce ON Fire Fighting

SYLLABUS
B. SC. (FIRE AND INDUSTRIAL SAFETY)
PART – I
Language: (01) Telugu
Course-II.1: GRAMMAR AND DRAMA
SECOND YEAR

GRAMMAR

Applied Grammar

1. Sangna Parichedamu
2. Sandhi Parichedamu ----- From Balavyakaranamu

Vruttas

1. Utpalamala
2. Champakamala
3. Saardhulam
4. Mattebam
5. sragddhara
6. Matakokila
7. Taruvooja
8. Siisam
9. Ataveladi
10. Tetagiti.

Alankatas:

I. Sabdalankaras:

II.

- I Vrutyuanuprasa
- 2 Chekanauprasa
- 3 Latanuprasa
4. Yamakam
- 5 Muktapadagrastham.

III. Arthalankaras:

- I Upamalankara
- 2 Utprekshalankara
3. Rupakalankara
4. Sabdalankara
- 5 Atisayoktyalankara
6. Sleeshalankara
7. Dipakalankara
8. Drushtaantalankara

DRAMA

- 1 Pagilina goodalu :Prof. G.V. Subrahmanyam
Pub: G.V.S. Prachuranalu, Hyderabad

PART – I
B. Sc. (FIRE AND INDUSTRIAL SAFETY)
Language: (02) HINDI

Course-II.1: GRAMMAR AND DRAMA
SECOND YEAR

GRAMMAR:

HINDI VYAKARAN By Prof. R.B. Varshneya, Published by Jithendhra Offset Printers, Delhi

DRAMA

1. Three Annotations out of Five
2. Essay Type Question – One out of two
3. Character sketch type question – One out of two.

PART – I
B. Sc. (FIRE AND INDUSTRIAL SAAFETY)
Language: (04) Malayalam
COURSE-I.1: PROSE AND POETRY
SECOND YEAR

GRAMMAR:

1. Keralapanineeyam - A.R.Rajaraavaramma
2. Sabdhasodhini - A.R.Rajaraavarmma
(Published by SPCS, Kottayam)

Applied Grammar:

- a. Vibhakthi b. Sandhi c. Samasam.

Vruttam:

- a. Sragdhara b. Saarduulam c. Kakali d. Manjari
e. Keka f. Nathonnatha g. Sleeshama

Alamkaram:

- a. Upama b. Utpreksha c. Rupakam d. Atisayokthi
e. deepakam f. Drushtaantam g. Sleeshama.

DRAMA

1. Kanyaka

by N.Krishna Pillai

(Complete)

Published by SPCS, Kottayam

PART – I

B. Sc. (FIRE AND INDUSTRIAL SAFETY)

Language: (05) Kannada

Course-II.1: GRAMMAR AND DRAMA

SECOND YEAR

GRAMMAR:

Applied Grammar:

1. Sangnaa Prakarana

2. Sandhi Prakarana

- From 'Shabdamani Darpana', by Keshiraja.

Ed: Abdul Basheer.

Vruttas:

1. Champaka maala

2. Uthpala maal

3. Shaadula vikreeditha

4. Mathebha vikreeditha

5. Sragdharaa

6. Mahasragdharaa

Alankaaras:

1. Shabdalanakaara:

i. Vruthyanupraasa
Chitrakavithva

ii. Chekanuprasa

iii. Yamaka

iv.

2. Arthlanakaaras:

i. Upamaalankaara

ii. Roopakalankaara

iii. Arthaantharanyasa

iv. Shleshaalankaara

v. Deepakalankaara

vi. Drushtathaalankaara

vii. Uthprekshaalankaara

DRAMA

A traditional or modern drama either translation or original about 100 pages. Appreciation of the theme, characters, technique and style of the drama etc.

Beralge Koral, Kuvempu, Udayaravi Prakashana, Mysore.

(Books available at Sapna Book House, Gandhi Nagar, Bangalore-9)

PART – II
B. Sc. (FIRE AND INDUSTRIAL SAFETY)
Course-II.2: English
POETRY AND DRAMA
SECOND YEAR

Poetry : Text for Detailed Study: Springs of Helicon. Ed. By T.R. Narasimhan Macmillan.

The Following poems are prescribed.

1. Elegy – Thomas Gray
2. Resolution & Independence – Worksworth
3. Ode to a Skylark – P.B. Shelly
4. To Autumn – John Keats
5. Ulysses – Alfred Tennyson
6. My Last Duchess – Robert Browning
7. Dover Beach – Matthew Arnold
8. The Blessed Damozel – D. G. Rossetti
9. The Man with the Hoe – Edwin Markham
10. A Prayer for my Daughter – W. B. Yeats
11. Mending Wall – Robert Frost
12. A Challenge to Fate – Sarojini Naidu
13. Snake – D. H. Lawrence
14. Journey of the Magi – T. S. Eliot
15. Insensibility – Wilfred Owen

Drama : Detailed Study:

1. As You Like It: William Shakespeare

Non-Detailed Study:

1. Short Plays of Yesterday and Today : Ed. By Dr. V. Sachithanandam, Macmillan.

PART – III
B. Sc. (FIRE AND INDUSTRIAL SAFETY)
Course – II.3 : FIRE ENGINEERING
SECOND YAER

Unit–I : Fundamentals of Fire Engineering

Fundamentals of Fire Engineering, Building Construction, Fire Detection and Control, Fire Hydrant System.

Unit–II : First Aid

First Aid for Burns, Personal Protective Equipments, Storage, Handling & Transportation of Flammable & Explosive Chemicals, Electrical Fires & their control Hydraulics.

Unit–III : Fixed Fire Fighting Installations

Fire Hydrant System, Tank cooling/ sprinkler system, powers, Fire Alarm System, Fire Detectors, smoke detectors and Flame Detectors

Unit–IV : Major Fire Fighting Systems and special installations

Fire Crash Tender, Foam and Foam making Equipment, IC Engines, and Rescue & Escape System, Station Administration

Unit–V : Specific Risks

Building Construction/Fundamentals of Civil Engineering, Air Craft and Ship Fire Fighting, Storage, Handling & Transportation of Flammable Explosive Materials, Electrical & Chemical Fires & their Prevention, National & International Codes on Fire.

Reference Books

- 1 Fire and explosion Hazards Handbook of Industrial Chemicals Publication: Jaico Publishing House
Author: Tatyana A. Devletshina & Nicholas P. Cheremisinoff, Ph. D.
- 2 Industrial Fire Protection Hand Book – Publication: CRC Press, Boca Raton, FL. Author: Schroll, R. C, 2002.
- 3 Fire Protection Hand Book – Publication: National Fire Protection Association USA Author: Quincy – Massachusetts
- 4 Electrical Safety, Fire Safety Engineering and Safety Management – Rao. S

PART – IV
B. Sc. (FIRE AND INDUSTRIAL SAFETY)
Course –II.4: Environment & Pollution
SECOND YAER

Unit–I

Importance of environment conservation, Effect of Pollution on Man and environment - Concept and Scope of Environmental Chemistry, Formation of Ozone in the Stratosphere – Natural Cycles of Environment Hydrological, Oxygen, Nitrogen, Phosphorous, Carbon and Sulphur Cycles – Radio –Nuclide in the environment

Unit – II

Causes of environmental degradation – and control actions recommended, Solid Waste Management – Sources, Classification of Solid Wastes – Methods of collection – Public Health aspects – Disposal methods.

Unit – III

Water pollution – Classification of Water pollutants – Characteristics of Waste water – Treatment methods – Sedimentation, Coagulation, Equilization, Neutralisation, Aerobic and Anaerobic processes – Evaporation, Ion Exchange, Chemical Precipitation and Electro dialysis

Unit – IV

Air pollution – Classification of Air pollutants - Climate change, Acid rain, Photo-chemical smog and global warming - Air pollution control methods and equipments source correction method. Cleaning and removal of gaseous effluents.

Unit – V

Sources of Noise & Vibration in Industries and in Environment- Control methods – Effects of Noise and vibration on Human and environmental systems - Wild life conservation, Deforestation & land degradation. Legal aspects of pollutions – laws.

Reference Books

1. Industrial Safety and Pollution Control Handbook – Nagaraj. J
2. Environmental Pollution Control Engineering, Author: C S Rao, Wiley Eastern Ltd.,
3. Industrial Safety Health and Environmental Management system Publication: Khanna Publishers
Authors: R.K Jain and Sunil S. Rao
4. ABC of Industrial Safety Remember ABC Publication: MEEDS Author: V P M Mani.

PART – V
B. Sc. (FIRE AND INDUSTRIAL SAFETY)

Course – II.5: Industrial Hygiene and Occupational Health
SECOND YAER

Unit-I

Introduction to Occupational Health, Fundamentals Of Occupational Health, Need For Occupational Health & Monitoring, Tip To Improve Occupational Health

Unit-II

Importance of industrial hygiene and good house keeping, ergonomics – study, community health, yoga for health and stress free life. Introduction to osha 18001.

Unit-III

Occupational related common diseases arise at work site, diseases due to physical hazards, chemical hazards, biological etc. Diseases arising from dust and its control measures.

Unit-IV

Legal aspects to control occupation related diseases, medical surveillance and facilities to control diseases, engineering aspects to control occupation related diseases, compensation and rehabilitation.

Unit-V

Work Physiology – Work capacity and man job alignment; Fatigue and rest allowances; Fitness criteria for work diet; psychological effects on human being and its treatment.

Reference Books

- 1 Electrical Safety, Fire Safety Engineering and Safety Management – Rao. S.
- 3) Industrial Safety Health and Environmental Management system Publication: Khanna Publishers
Authors: R.K Jain and Sunil S. Rao.
- 5 Safety, Security and Risk Management – Singh U. K.

PART – VI

B. Sc. (FIRE AND INDUSTRIAL SAFETY)

**Course – II.6: Practical Viva – Voce on Fire Fighting
SECOND YAER**

Part A

Record Book: Contains the following topics

1. Draw and write up on the type of Fire Extinguisher (DCP/ Water/ Foam / CO₂).
2. Draw and write up on the type of Fire hoses/ hose fitting.
3. Draw and write up on Step by step operation of portable extinguishers.
4. Recharging method of portable extinguishers.
5. Draw and write up on handling procedure of different type of branches.

Part B

Written test on the above mentioned topics

Part C

Identify the displayed Equipments

1. Step by step operation of portable extinguishers.
2. Recharging method of portable extinguishers.
3. Handling procedure of different type of branches.

Part D

Viva-voce

B. SC. (FIRE AND INDUSTRIAL SAFETY)

REGULATIONS AND SYLLABUS

FINAL YEAR

Course Contents

- Part – I Safety & the Law
- Part – II Safety Management
- Part – III Safety in Chemical & Electrical Industry
- Part – IV Fundamentals of Disaster Management
- Part – V Dissertation and Viva

PART – I
B. Sc. (FIRE AND INDUSTRIAL SAFETY)
Course – III.1 : Safety & the Law
FINAL YAER

Unit–I: History of Safety Legislation

Introduction to National Safety Council (NSC); Introduction to ILO Convention and Recommendations in providing safety; health and welfare of workers.

Unit–II: Factories Act – 1948

Factories Act, Chapter – III-Health provisions, Chapter-IV-Safety Provisions, & Chapter-V-Welfare Provisions according to amendment; Case laws and the factories act.

Unit–III: Employees Welfare

Workmen Compensation Act and Rules; ESI Act and Rules; Contract Labour Act; Employer’s Liability Act; Common Law and Product Safety

Unit–IV: Other important legislations & OHSAS

Electricity Act; Indian Explosive Act; Gas Cylinders; Petroleum Act; Statutory provision on Building and other construction works;

Unit–V: Environment related Acts & CPCB

Environmental Protection Act; The Water (control of pollution) Act; The Air (Control of Pollution) Act; Noise Pollution Act; Chemical Accidents (Emergency Preparedness, planning and response).

Reference

- 1) Pressure Vessels for Industry – Mc Graw Hill by Larry M.Soring
- 2) Techniques of Safety Management-Mc Graw Hill by D.Peterson

PART – II
B. Sc. (FIRE AND INDUSTRIAL SAFETY)
Course – III.2 : SAFETY MANAGEMENT
FINAL YAER

Unit–I

Introduction to Management and Management Principles, Safety Management Role – Managerial Responsibilities, Principle of Management.

Unit–II

Planning for safety, purpose, procedure, variety forms of plans, safety policy, planning for process implementation, communication importance.

Unit–III

Organizing for safety – Nature and principles organization structure of safety, role of safety officer, functions in safety department, leadership methods.

Unit–IV

Motivation to the employees – importance, safety education and training- training methods, assessment or evaluation of training programs.

Unit–V

Safety committee-structure and functions, Auditing – types, procedures, key elements of audit, emergency planning – types and importance.

Reference Books

- 1) Abc of industrial safety remember abc publication: meeds author: v p m mani.
- 2) Industrial accident prevention – publication: mc graw-hill – author: herbert william heinrich.
- 3) Industrial safety health and environmental management system publication: khanna publishers, authors: r.k jain and sunil s. Rao
- 4) Industrial safety management publication: tata mc graw-hill publishing company ltd. Author: l. M. Deshmukh

PART – III

B. Sc. (FIRE AND INDUSTRIAL SAFETY)

Course – III.3 : Safety in Chemical & Electrical Industry

FINAL YAER

Unit–I

Safety in Chemical industry, Instrumentation for safe plant operations, Hazard in Unit Processes & Operations: Control Measures, specific safety measures for chemical industries like Fertilizer, Explosives and Polymer plants. Assessment of fire explosion and toxicity index, Dow & Mond, dispersion, Probability analysis and modeling; Pressure vessels fired and unfired, codes of practices governing their safety; Assessment of vessels and test checks

Unit–II

Storing and handling; Chemicals Compatibility Considerations; Transportation of Chemicals; Safety Precautions for transporting hazardous / toxic / flammable / explosive/ radio-active substance. Transfer of chemicals by pipelines within and outside installations. Inspection techniques for plants, reaction vessels, check list for routine inspection, checklist for specific maintenance; corrosion and erosion, location, causes inspection and prevention.

Unit–III

Color coding identification of contents; Safety Precautions for working on pipelines; Safe procedures of start up and shut down procedures; Safety in preventive and emergency maintenance operations; Use of Material Safety Data Sheets.

Unit–IV

Introduction to electricity, how electrical fires start, danger sign for some wiring, cables, safety valve, how electricity can shock you? First Aid, some precautions to avoid electrical accidents. Dangers from electricity – safe limits of amperages, voltages – safe distance from lines – capacity and protection of conductors – joints and connections – means of cutting off power – Overload and short circuit protection.

Unit–V

Selection of materials, Lighting, unavoidable electrical heat, and Thermal power plants – safety measures in thermal power plants, turbine, generator, hydrogen plant, transformer yard, cable galleries, fire station, fire extinguishers, first aid and medical facilities, conclusion. Static electricity and electricity in mention, how electricity causes Injury, Know basic first aid in case of electrical emergency, some don'ts with electricity, Prevent electrical fires, three main causes of fire in industry, Electrical wiring and handling of electrical equipment

Unit–VI

Earth fault protection, Earth, insulation and continuity tests – Protection against over voltage – hazards arising out of “borrowed” neutrals precautions – Portable electrical apparatus – Flame proof – Electrical equipment – precautions in their selection

Reference

- 1 Chemical Reaction Hazards – A guide to Safety by John Barton.
- 6 The Chemical Industry – Mc Graw Hill by C.A. Heaton.
- 7 Electrical Safety Handbook (Hardcover - 2005/09/30) by John Cadick (Author), Mary Capelli-Schellpfeffer (Author), Dennis K. Neitzel (Author).
- 8 National Electrical Safety Code Handbook: A Discussion Of The Grounding Rules, General Rules, And Parts 1, 2, 3, And 4 Of The 3rd (Paperback - 1996) by Clapp.

PART – IV

B. Sc. (FIRE AND INDUSTRIAL SAFETY)

Course – III.4 : Fundamentals of Disaster Management

FINAL YAER

Unit – I: About Hazards and Disaster

Types of Hazards, What is Disaster, Types of Disaster, Phases of Disaster, Reaction of people to Disaster, Direct affect of Disaster and Indirect affect of Disaster.

Unit – II: Disaster Administration

Disaster Administration – Role f State and Central Government Key responsibilities; Restructuring of the relief department In the state NGOs – Civil Society and their role in implementation.

Unit – III: Disaster Management Policy

Disaster Management policy – Disaster Management Act; Disaster Management Code; Disaster Risk Management Progammes – in India.

Unit – IV: Disaster Planning and Disaster Management Plan

Prerequisites for preparedness planning; Hazardous risk and vulnerability – preparedness planning for emergency responses.; National plan Vs disaster plans; Action plan and procedures – guidelines for action plan; Preparedness role and Responsibility Training Issues and models; Integrating disaster management into development planning

Unit V: Plan Management Approach

Multi hazard approach to disasters – sustainable and continuous approaches; Effective inter-agency cooperation and coordination – capacity buildings

Reference Books

1. Goel, S. L.: (2005), *Disaster Management*, A.P.H. Publishing Corporation New Delhi.
2. Arvind Kumar: (2007), *Disaster Management – Recent Approaches*, Anmol Publications New Delhi.
3. Ramesh R.Rao, Jon Eisenberg, and Ted Schmitt, (Ed): (2007), *Improving Disaster Management*, The Role of IT in Mitigation Preparedness, Response, and Recovery.

PART – V

B. Sc. (FIRE AND INDUSTRIAL SAFETY)

**Course – III.5: Dissertation and Viva
FINAL YAER**

A Student has to take-up a Project work, as it is partial requirement of the award of B. Sc. (FIRE AND INDUSTRIAL SAFETY). The Project Report must be based on detailed and intensive study in the Industry and the scope of the project is as follows:

Scope of the project work:

- To gain an insight into Industrial Safety and Fire Fighting, to know how the problems of Industrial Safety are indentified and solved.
- To help the Safety Officers, Safety engineers and Safety Specialists to find solutions to their problems.
- To examine and evaluate the Safety Performance of the Industry.
- To study the causes of accidents with particular reference to the prevailing unsafe conditions and practices.
- To give exposure to the students and to develop the ability in the fields of Hazards, Training, Management and Methodology of Planning a Study, Data Collection, Analysis, Presentation and Decision Making on the Problems related to Safety industry.

* * *