

Subject: Approval of the Regulations for Bachelor of Science (Fire Safety and Hazards Management) And M.sc (Fire safety and hazard management)Programme.

- 1. Programme Title : - 1.Bachelor of Science (3 year Duration) and M.sc (Fire Safety and Hazards Management)**
- 2. Programme Short Title: - BSC(FSHM) and M.Sc (FSHM)**
- 3. Total Duration: - 3 Years AND 2 years Respectively**
- 4. Eligibility: - 10+2 (Any Stream.) and any Degree Respectively**
- 5. Optional Early Exit Certification: -**

Students are required to Submit Certification Fees for Optional Early Exit Certification as prescribed by Ballsbridge university from time to time.

5.1 Diploma in Fire Safety and Hazards Management (DFSHM): - On Demand by the Student on Successful Completion of First Year of the Programme.

5.2 Advance Diploma in Fire Safety and Hazards Management (ADFSHM): - On Demand by the Student on Successful Completion of First & Second Years of the Programme.

6. Credit Transfer: -

6.1 Second Year of Programme: - For the Candidates who has successfully completed First Year of Programme from a recognized University/ Institution or any other Institution recognized by Ballsbridge university. A student admitted under this system requires submitting fees for Second Year of the Programme along with Credit Transfer fees as prescribed by Ballsbridge university from time to time.

6.2 Third Year of Programme: - For the Candidates who has successfully completed First & Second Years of Programme from a recognized University/ Institution or any other Institution recognized by Ballsbridge university. A student admitted under this system requires submitting fees for Third Year of the Programme along with Credit Transfer fees as prescribed by Ballsbridge university from time to time.

6.3 The cases where exact title of Programme is different from the aforementioned Programme Title and more than 75% credits earned in previous qualification matches with the Programme Credits then such Credit Transfers are permitted by the Ballsbridge university as per 6.1 and 6.2.

7. Skill Based Credit Transfer: -

A Candidate who has successfully completed minimum two years of work experience in relevant field or have completed minimum of two year professional certification from an institution after prescribed qualification for the admission into programme are eligible for Skill Based Credit Transfer. The Skill Based Credit Transfer candidates have to appear in all theory examinations in order to earn minimum Two Years credits of the Programme.

7.1 Second Year of Programme: - Such Candidates are required to earn mismatched theory, practical and industrial credits of First Year along with Second Year Examinations. A student admitted under this system requires submitting fees for First and Second Year of the Programme along with Skill Based Credit Transfer fees as prescribed by Ballsbridge university from time to time.

7.2 Third Year of Programme: - Such Candidates are required to earn mismatched theory, practical and industrial credits of Second Year along with Third Year Examinations. A student admitted under this system requires submitting fees for Second and Third Year of the Programme along with Skill Based Credit Transfer fees and Lateral Entry Fees/ Credit Transfer Fees (whichever applicable) as prescribed by Ballsbridge university from time to time.

8. Lateral Entry: -

8.1 Second Year of Programme: - “One Year Diploma in Fire Safety and Hazards Management (DFSHM) / Diploma in Fire Safety Management (DFSM) after 10+2” or equivalent from a recognized university/ institution/ board or any other institution recognized by Ballsbridge university. A student admitted under this system requires submitting fees for Second Year of the Programme along with Lateral Entry fees as prescribed by Ballsbridge university from time to time.

8.2 Third Year of Programme: - “Two Years Advance Diploma in Fire Safety and Hazards Management (ADFSHM) after 10+2” or equivalent from a recognized university/ institution/ board or any other institution recognized by Ballsbridge university. A student admitted under this system requires submitting fees for Third Year of the Programme along with Lateral Entry fees as prescribed by Ballsbridge university from time to time.

9. Programme Contents :-

First Year		
Sr. No.	Name of Subject	Credits
1	Safety Management	
2	Fire Science - Part-I	
3	Fire Technology	
4	Industrial Safety	

5	Communication & Soft Skills	
6	Construction Industry Safety-I	
7	Construction Industry Safety- II	
8	Emergency Planning & First Aid	
9	Practical Work	
10	Viva - Internship & Training	
Total		

Second Year		
Sr. No.	Name of Subject	Credits
1	Fire Science- Part-II	
2	Security Management of Industrial Plants	
3	Organization, Administration and Management Responsibility	
4	Chemical & Environmental Hazards	
5	Industrial Psychology, Ergonomics and Accidents	
6	Industrial Noise and Noise Control	
7	Industrial Safety Analysis	
8	Safety in Power Plants	
9	Practical Work	
10	Viva - Internship & Training	
Total		

Third Year		
Sr. No.	Name of Subject	Credits
1	Radiation Hazards	
2	Safety Training for Employees and HRD	
3	Social Security in Industries	
4	Occupational Health	
5	Controlling Environmental Pollution	
6	Disaster Management	
7	Energy Conservation & Sustainable Development	
6	Practical Work	
7	Viva - Internship & Training	
Total		

Total No. of Credits of Programme: -

10. Detailed syllabus: -

First Year

First Year		
Sr. No.	Name of Subject	Credits
1	Safety Management	
2	Fire Science - Part-I	
3	Fire Technology	
4	Industrial Safety	
5	Communication & Soft Skills	
6	Construction Industry Safety-I	
7	Construction Industry Safety- II	
8	Emergency Planning & First Aid	
9	Practical Work	
10	Viva - Internship & Training	
Total		

Subject Name: Safety Management

UNIT I

Fundamentals of Safety
Need for Safety
Definition : Accident, Near miss
Accident Sequence : Heinrich Triangle & Domino Theory
Causes of accidents
Classification of accidents
Reasons for accident prevention
Methods of accident prevention
Responsibility of management towards Safety
Unsafe acts and unsafe working conditions
Cost of accidents
Role of management, Supervisors and workers in safety
Motivation for safety

UNIT II

Need for integration of Safety Health and Environment (S, H & E)
Safety and government role
Safety act and provisions for worker's welfare
General Instructions for Safety
Approaches to prevent accidents
Factory act 1948 and amendment 1987

UNIT III

Introduction to Safety and Safety Management
Principles of Safety Management
Planning: Types of plans, steps in planning, and process of planning.
Nature of objectives, setting objectives.
HSE Policy
Project HSE Plan
Statutory requirements, Rules and Regulations
Supervision

UNIT IV

Safe work place

Objectives of Safety and Security measures
Site Security, Fencing and gates, Security personnel their role in safety, lighting

Objectives of Safety Management
Record keeping

Subject Name: Fire Science -
Part-I

UNIT I

• Terms and Definitions: Molecule, Atom, valency, Oxidation, Elements, Compound, Exothermic reaction, Endothermic reaction, Calorie, Specific heat, Matter, Temperature, Mixture.

UNIT II

Basic Chemistry of fire

Chemical reaction
Heat formation
Heat of combustion
Mechanism of combustion
Flash Point fire Point
Spontaneous Ignition Temperature
Fire
Fire triangle
Components of fire
Fire Tetrahedron
Chain reaction
State of matter
Spread of Fire
Extinction of
Fire
Quenching of free radicals
Back drought
Delayed Back drought

UNIT III

Classification of
Fire Class A Fire
Class B Fire
Class C Fire
Class D Fire
Class E Fire
Class K Fire
Electrical
Fire
Extinguishing media for various class of Fire

UNIT IV

Properties of solid, liquids and gas.
Prevention of Fire
Causes of initiation of Fires

Subject Name: Fire
Technology

UNIT I

Foam

Definition
Qualities of good foam
Types of foam
Chemical foam, mechanical foam,
Ventury effect,

Hose

Definition
Types of hoses
Delivery hose, types of delivery hose, lined hose, unlined hose,
Characteristics of hose
Advantages and disadvantages of lined and unlined hose
Care and maintenance of hoses.
Storage and use of hoses
Couplings, Adapters, Breaching piece, Nozzles, inductors, FMB, Hose reels,

Hose drill

Primers

Definition,
Necessity of primers in fire fighting
Type of primers, Working principle of each type of primer
Effect of atmospheric pressure on water when primer is used
Care and maintenance

UNIT II

Pumps

Definition
Types of pumps, Centrifugal force
Working principle of each type of
pump Reasons for failure of pump
Care and maintenance

Fire Fighting Clothing

Basic Fire protective clothing

Advantages of wool over cotton, Full fire fighting rig, Type of
suits. Donning procedure, Washing, re-proofing, Care and
maintenance Fire Proximity Suit

Fire Entry Suit
Thermal Imaging

Aircraft Crash Rescue and Fire Fighting

Definitions
Layout of a standard airfield
Airfield Markings
Runway Lighting
Rescue Operations

UNIT III

Breathing Apparatus

Introduction
Smoke Mask
SCBA, BASCCA, ELSA
Donning procedures, Operating procedure
Face seal checks, routine checks
BA Controller, Duties of BA Controller
Life line, Personnel line, guide line.

Ladders and Knots

Introduction
Parts of ladders
Type of ladders

Uses of Ladders, Ladder drill

Different Types of Knots

Fire Fighting Vehicles and Appliances

Domestic Fire Tenders

Crash Fire Tenders

Hydrants, Branch pipes,

Subject Name: Industrial
Safety

UNIT I

Industrial Hazards

Physical hazards

Chemical hazards

Mechanical hazards

Biological hazards

Ergonomic hazards

Noise hazards

Chemical safety

Toxicity

IDLH (Immediate Danger to Life and Health)

Chemicals - Storage, Handling and Transportation

Preventive measures for chemical spillage

Transport Emergency Card (TREM Card)

Electrical Safety

What is electricity

Safety in use of electricity

Dangers from electricity

Importance of safety equipments in design and use of switches, switch

fuses, circuit breakers and isolating lines

Over load and short circuit protection

Earth fault protection

Earthing of electrically driven equipments

ELCB

Precautions

Static electricity

Electrical shock treatment

Points to be checked at the electrical system

UNIT II

Workshop Safety

Hand tools and Power tools

Safety while using Grinding stone

Welding and gas cutting safety

Dangerous points

Lubrication Safety

Petroleum Refineries

Refinery Process

Classification of Petroleum Products

Storage Tanks

UNIT III

Hazard Evaluation Techniques

HAZOP Study

Job safety analysis

Fault tree analysis
Event tree analysis
Failure modes and effects analysis
Relative ranking techniques

Monitoring of Safety Performance

- Statistics of accidents
- Frequency rate and severity rate
- Frequency severity incidence
- Safe – T – score

UNIT IV

House Keeping

- Definition
- Need for house keeping
- Importance in view of safety
- Methods

Safety Inspections

- Safety Audit
- Safety Survey
- Plant safety inspection
- Safety tour
- Safety samplings

Subject Name: Communication & Soft Skills

UNIT I

Essentials of Grammar:

- Parts of Speech
- Punctuation
- **Vocabulary Building**
- Phonetics

UNIT II

Office Management:

- Types of Correspondence
- Receipt and Dispatch of Mail
- Filing Systems
- Classification of Mail.
- Role & Function of Correspondence
- MIS
- Managing Computer

UNIT III

Letter & Resume Writing:

- Types of Letters-Formal / Informal
- Importance and Function
- Drafting the Applications
- Elements of Structure
- Preparing the Resume
- Do's & Don'ts of Resume
- Helpful Hints

UNIT IV

Presentation Skills:

- Importance of Presentation Skills
- Capturing Data
- Voice & Picture Integration
- Guidelines to make Presentation Interesting
- Body Language
- Voice Modulation
- Audience Awareness
- Presentation Plan
- Visual Aid

- Forms of Layout
- Styles of Presentation.

UNIT V

Interview Preparation:

- Types of Interview
- Preparing for the Interviews
- Attending the Interview
- Interview Process
- Employers Expectations
- General Etiquette
- Dressing Sense
- Postures & Gestures

UNIT VI

Group Discussion & Presentation:

- Definition
- Process
- Guidelines
- Helpful Expressions
- Evaluation

Subject Name: Construction Industry
Safety-I

UNIT I

Safe Work Place

- Safe means of access
- Fall Protection
- Safety while working on Roofs
- PFASS (Personal Fall Arrest Safety System)

Scaffolding

- Parts of Scaffold
- Ladder Access
- Working on Scaffold
- Basic requirements of Scaffolding
- Erection of Scaffolding
- Scaffolding Safety
- Scaffold Inspection

UNIT II

Ladders

- Types of Ladders
- Selection of ladders
- Ladder Positioning
- Safety Precautions

Permit To Work System (PTW)

- Definition
- Hot Work Permit
- Cold Work Permit
- Responsibilities relating with PTW
- Circumstances when Permit is required
- Confined Space entry

UNIT III

Personal Protective Equipment (PPE)

- Need and importance of PPE
- Employer's responsibilities
- Employees responsibilities
- Types of PPE
- Head Protection
- Eye and Face Protection
- Ear Protection

Hand Protection
Leg Protection

Skin Protection
Respiratory protection

HSE Training

Importance of Safety Education
Safety Training
Objectives of HSE training and education
Induction Training
In-house Training
Specialised Training
Tool Box Meeting (TBM)

Subject Name: Construction Industry
Safety- II

UNIT I

Safe Use of Hand Tools and Portable Power Tools

Hand Tools
Ten Commandments for personnel using hand tools
Portable Electric Power Tools
Pneumatic Tools
Lone Working

Safe Operation of Vehicles, Equipment and Machinery

Workplace Transport
Hazards
Pedestrian routes
Vehicular routes
Reversing operations (Safety guidelines)
Instructions for drivers
Hand held Power circular Saws
Chain Saws
Abrasive Wheels

UNIT II

Safe Material Handling Operations

Safe Handling of materials
Major injuries
Lifting appliances
Safe operations of Cranes
Pilings, Rigs, Side Booms
General Safety Requirements for Lifting operations

Accident Reporting, Investigation and Analysis

Definitions
Lost Time Injury
(LTI) Multiple LTI
Lost Time Injury Frequency Rate (LTIFR)
Lost time Injury Severity Rate
(LTISR) Reporting near misses
Reporting Accidents

UNIT III

Major activities of Construction Project

Definitions
Excavation Hazards & precautions

Methods of Excavation

Welding and Cutting Operations
Types of Welding
Hazards and precautions for welding
Confined Space entry precautions
Painting operations - Hazards and precautions
Sand Blasting - Hazards and precautions
Demolition - Hazards and precautions

Subject Name: Emergency Planning & First Aid

UNIT I

On site Emergency Planning

On-site Emergency Plan
Emergency Alarm System
Emergency Control Room
Key personnel
Emergency Control Program

Off site Emergency Planning

Off-site Emergency Plan
Mutual Aid Scheme
Emergency Evacuation
Security and Media management

UNIT II

Hazard Communication

Safe Handling of hazardous substance
Material Safety Data Sheet (MSDS)
Use of hazardous and Toxic substance
Storage and Handling
Transportation of Hazardous substance

First Aid Introduction

Principles of First Aid
Aid Training in
First Aid
General rules of First Aid
Shocks
Electrical Shock
Artificial Respiration
Cardio Pulmonary Resuscitation
Chocking
Fainting
Poisoning
Open Wounds
Control of
bleeding Burns
and Scalds Heart
Attack

Second Year

Second Year

Sr. No.	Name of Subject	Credits
1	Fire Science- Part-II	
2	Security Management of Industrial Plants	
3	Organization, Administration and Management Responsibility	

4	Chemical & Environmental Hazards	
5	Industrial Psychology, Ergonomics and Accidents	
6	Industrial Noise and Noise Control	
7	Industrial Safety Analysis	
8	Safety in Power Plants	
9	Practical Work	
10	Viva - Internship & Training	
Total		

Subject Name: Fire Science-
Part-II

UNIT I

Basic physics

- Units
- Guidelines for writing the units
- Force, resultant force
- Laws of force
- Laws of motion
- Mass and weight, work, power, energy
- Law of conservation of energy
- Mechanics – rest and motion
- Distance and displacement
- Speed and velocity

UNIT II

Fire Chemistry – II

Atomic structure

- Elements, compounds
- Pure substance and mixture
- Physical and chemical changes
- Condition for the changes
- Energy changes
- Effects of heat on matter
- Combustion
- Temperature
- Specific heat capacity
- Catalyst
- Neutralization
- Sublimation
- Heat of decomposing
- Chemical reaction
- Exothermic reaction and endothermic reaction
- Transmission of heat
- Flash and fire point
- Flammables and combustible chemicals
- Spontaneous combustion

Subject Name: Security Management of Industrial Plants

UNIT I

Introduction

Need of Security Arrangements in Industrial Plants

Security Programme

Fencing and Walls

External Landscape

Lighting

UNIT II

Alarm System
Visitor Entry Pass
Employee entry Pass
Communication
Safe Keys and Locks

UNIT II

Security Guard Force
Check List for Plant Security
Security Staff Parade Drills
Discipline
Record Keeping

Subject Name: Organization, Administration and Management Responsibility

UNIT I

Introduction
Objectives
Basic Safety Programming
Safety Department

UNIT II

Management Responsibility for Safety
Safeguarding Public
General Safety Rules
Responsibilities of Government
Responsibilities of Social
Organizations Responsibilities of
Public Authorities

UNIT III

Safety Activities of ILO
Maintenance and Safety
Factories Act – 1948
Inspection and certifying

Subject Name: Chemical & Environmental Hazards

UNIT I

Introduction
Multiple effects of Chemicals
Industrial Toxicology
Toxic Chemicals and its harmful effects on Humans
Harmful effects of Chemicals
Factors influencing the effects of Toxic Materials
Units of concentration

UNIT II

Chemical Hazards Exposures
Safety Analysis
Control Measures
Management of Workplace Exposure
Plant Operations
Dust Explosions

UNIT III

Introduction to Environmental Hazards
Terms and Definitions
Pollution
Environment Pollutants
Energy, Man and Environment
Law of Conservation of
Energy Thermodynamics

Subject Name: Industrial Psychology, Ergonomics and Accidents

UNIT I Introduction

Industrial
Psychology
Scope of Industrial Psychology
Concepts of Industrial Psychology
Principles of Industrial Psychology
Applications of Industrial
Psychology Industrial Accidents
Human Carelessness
Accident Proneness
Physical Factors

UNIT II

Vision
Reaction Time
Relationship between Perception and muscular responses and injuries
Relationship between Intelligence and Injury Experience
Hearing
Emotional Instability
Fatigue
Illumination
Noise

UNIT III

Vision
Atmospheric conditions
Job stress and its effect
Coping with stress
Bio Mechanics and Ergonomics
Industrial Ergonomics and Measurements

UNIT IV

Physiology
Psycholog
y
Working Environment

Subject Name: Industrial Noise and Noise Control

Industrial Noise and Noise Control

UNIT I

Introduction
Effect of noise on the auditory system
Electrical noise and interferences
Audible Noise
Acoustics

Fundamentals of sound
Measurement of audible noise

UNIT II

Attenuation of Sound Pressure Levels
Acceptable levels of
noise Criteria for Hearing
Loss Control of noise
Noise Abatement
Vibration
Gallopings

UNIT III

Corona vibrations
Vibration Dampers
Audiometric
Testing Hearing
Protectors Record
Keeping

Subject Name: Industrial Safety
Analysis

UNIT I

Introduction
Homogeneity in system analysis
Locating and defining injury sources
Sources of Data
Identify causes of Injury
Information for
identification Subsidiary
facts
Injury Investigation

UNIT II

Evolution of Methodical Analysis
Binary Number System
Computer Logic
Safety Analysis Technique
Fault Tree Calculations
Fault Tree Limitations

UNIT III

Failure Modes and Effect Analysis
Other systems analysis Techniques
Risk Tolerability

Subject Name: Safety in Power
Plants

UNIT I

Responsibilities of Employees
General Safety Requirement/guidelines
Boilers
Structure and Buildings

Control of Fluid systems safety
Safety guidelines for high speed rotary equipment
Gas Turbine
Fuel Pipe Line
UNIT II

Safety of Diesel Stations
 Electrical quality associated with Human Injury
 Safety Precautions for electrical workers
 Safety Rules for Line Men
 Authorization
 Care and storage of live line tools

UNIT III

HT and EHT Cables
 Precautions in respect of Storage Batteries
 Electrical Maintenance
 Earthing

**Third
 Year**

Third Year		
Sr. No.	Name of Subject	Credits
1	Radiation Hazards	
2	Safety Training for Employees and HRD	
3	Social Security in Industries	
4	Occupational Health	
5	Controlling Environmental Pollution	
6	Disaster Management	
7	Energy Conservation & Sustainable Development	
6	Practical Work	
7	Viva - Internship & Training	
Total		

Subject Name: Radiation
 Hazards

UNIT I

Definitions
 Nuclear
 Energy
 Nuclear
 Fission
 Nuclear Cycle
 Enrichment
 Fabrication
 Nuclear Fission Chain
 Reaction Nuclear Cycle Re
 processing Nuclear Power
 Plant

UNIT II Natural Gas

Thermal Neutrons
 Enrichment Process
 Chain Reaction

Ionizing and non ionizing radiation
Particulate and electromagnetic radiation
Radiation Dose
Alpha Radiation
Gamma Radiation
Cosmic Radiation

UNIT III

Ionizing Radiation Controls

Devices for measuring
Radiation Controlling Radiation
Hazards Controlling Radiation
Exposure Non ionizing
Radiation
Disposal of Radioactive wastes

Subject Name: Safety Training for Employees and HRD

UNIT I

Definitions
Methods of Training to Industrial Employees
Discussion Groups
Continued Training
Training Facilities
Benefits of Training to Employees
Specialized Training for Safety
Positive Instructions

UNIT II

Human Resource Development
(HRD) HRD Concept
Nature of HRD
Objectives of
HRD Benefits of
HRD Concept of
HRD HRD
Matrix
HRD Process
Challenges and Tasks
Emerging Horizons
HR Managers

Subject Name: Social Security in Industries

UNIT I

Definitions
Scope of Social Security
Social Security in India
Administration
Working of ESI
Benefits of
Workers

UNIT II

Group Life Insurance
Workman's Compensation Act
Maternity Benefit Act
Employees Provident Fund Act
Right to Payment for
Maternity

UNIT III

Insurance Policies

Taking Policy Transit
Insurance Employees State
Insurance Inspection/
Safety Audit After Fire
incident
After Theft
After Accident

Subject Name: Occupational
Health

UNIT I

Introduction
Occupational Health Risks
Ways to reduce occupational Risks
Excerpts from ILO Convention
Measures for Occupational Health and Safety
Compensation and Rehabilitation

UNIT II

Working Women
Working Children
Insurance Schemes
Tips to improve Occupational Health
Community Health
Health services

UNIT III

Preventive medicines
Illness and Healing
Degenerative Illness
Common Diseases
Care of ENT
Diseases: Causes and cures

Subject Name: Controlling Environmental
Pollution

UNIT I

Introduction
Survival of the environment
Conflict between North and South
Endangered Earth
Environmental Control Regulations
Control through education
Impact Assessment
Prevention and control of pollution
Central Pollution Control Board

UNIT II

Approaches to environmental Regulation
Concept of Industrial Ecology
Environmental Management System
Compliance to Legislations
Environmental Standards
ISO 14000
International Environmental guiding Principles

UNIT III

Environment Management
Integrated approach in managing Safety & Environment
Development process towards sustainability
Management and waste disposal system
Hazardous Waste Management

Subject Name: Disaster Management

UNIT I

Introduction
Disaster Management Plan
Disaster Zoning for natural calamities
Important consideration in Disaster Management
Structure
Constitution
Needs and resources to tackle disaster

UNIT II

Pre-Disaster preparedness
Post disaster response and recovery
Control of emergencies
Organization consideration
Concept of communication

UNIT III

Pre-Disaster preparedness
Disaster Management Plan
Fire : Disaster

Subject Name: Energy Conservation & Sustainable
Development

UNIT I

Energy Conservation Act
Bureau of Energy
Efficiency Energy
Management
Energy Conservation
Energy Audits
Indian Renewable Energy Development Agency
(IREDA) Sustainable energy development

UNIT II

Introduction to sustainable development
Issue of achieving sustainable development
Optimal resource utilization
Sustainable cities
Sustainable Transportation system

UNIT III

Sustainable mining Technology
Energy conservation
Sustainable Future
Efficient energy management
Bio-Methanation
Bio filtration
Sustainable development
Protection of atmosphere

