

M.Sc.-Industrial Hygiene and Safety

Course Description and Learning Outcome

SEMESTER - 1

Subject: PS01CIHS21 Introduction to Industrial Hygiene, Occupational Health & Environmental Toxicology

Faculty: Dr R R Tiwari, Dr H G Sadhu, Mr Baiju G Verghese

Course Description : This course introduces and defines Industrial Hygiene (IH)Occupational Health (OH)and Environment Toxicology. What are the benefits of IH. It also stress on the various diseases which can be developed from the exposure of various Inorganic metals , gases, dusts etc. Environment Toxicology focuses on the Entry distribution and Excretion of toxic elements in the body and fate of the toxicants.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Students understand basic concepts of Industrial Hygiene ,Occupational Health & Environment Toxicology
- Benefits of Industrial Hygiene
- Functions of Occupational Health Center
- Occupational Health related problems and its control in workplace
- Effects of various Toxicants in body

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Course Description and Learning Outcome

SEMESTER - 1

Subject : : PS01CIHS22 Safety Management

Faculty: Mr. Baiju G Verghese

Course Description : The course introduces management practices in the industry with focus on Safety management. It introduces hazards, unsafe action unsafe condition and causation of Accidents. The course also offers Safety Philosophy and Psychology . Its focus on Safety training and education of workers and also learn about direct and indirect costs in accidents.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Management of Safety in work places
- Understand the Behavior aspects of workers
- Will be able to give Safety education and train the workers.
- Able to calculate direct and indirect costs.
- Can act as a bridge between Management and Workers

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Course Description and Learning Outcome

SEMESTER - 1

Subject : PS01CIHS23 :Air Sampling Analysis

Faculty: Mr. Mitul Desai

Course Description : The course introduces Air Sampling practices in the industry which comes under the Evaluation part of the Industrial Hygiene. Here the various type of sampling methods are being highlighted.

Environmental Air sampling analysis focus on the techniques by which sample can be analyzed.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Understand various organization working for safety and health
- Students will able to perform the various sampling
- Introduced to the Threshold limit values
- Implementation of controls in the work place
- Various Air monitoring instruments used in work place

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Course Description and Learning Outcome

SEMESTER - 1

Subject : PS01CIHS24: Safety Engineering- I

Faculty: Mr. Baiju G Verghese

Course Description: The course provides basic information about the Industrial Safety can be achieved in Industries.

The course focus on Plant siting, Good Housekeeping safe Manual and Mechanical Material Handling etc.

Fire , Electrical Safety and Static Electricity are main causes of accidents are specifically highlighted in the chapters.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Help students in start up of own industries in latter stages
- Help students in keeping good housekeeping and accident prevention
- Fire prevention and act as a leader in fire emergencies
- Work At Height associated dangers are learned in the chapters
- Can design Training programmes in Manual Mechanical handling ,Work at Height etc

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Course Description and Learning Outcome

SEMESTER – 1

Subject : PS01FIHS26 Introduction To Human Physiology, Biostatistics And Epidemiology

Faculty: Dr Udayshankar Singh, Dr Hasmukh Shah and team

Course Description : The course is divided in three parts namely Human Physiology, Biostatistics And Epidemiology. The first focus on the various systems in the body. Biostatistics focus on Data Application, uses, scope of Biostatistics in Occupational Hygiene & Health. Epidemiology, Analytical and experimental methods used in studies of disease in human populations measures of exposure effect, Estimating exposures, chronic disease, infectious disease, occupational exposures, environmental and life style factors are of focus.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Learn the importance of Systems of the Human Body
- Can be able to perform the statistics w.r.t to calculations surrounded with various subjects of course
- Explain workers during the training about the case studies learned and its effects.
- Can perform cross sectional ,cohort etc studies

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Course Description and Learning Outcome

SEMESTER – II

Subject : PS02CIHS21: Industrial Ventilation

Faculty: Mr. Baiju G Verghese Mr Mitul Desai

Course Description :The course introduces the students Industrial Ventilation use

In the Industry. Industrial Ventilation is used a part of control wrt to Industrial

Hygiene to protect against Toxic and Non Toxic hazards.

HVAC system highlights the requirement against thermal comfort needed in workplaces

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Able to design Ventilation systems for the various workplaces
- Understand the principles of Industrial Ventilation
- Able to Test ventilation systems
- Educate workers in workplace about the effectiveness of Ventilation Systems
- Ventilation for Heat control, Heat Balance and Exchange can also made understand at workplaces

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Course Description and Learning Outcome

SEMESTER – II

Subject : PS02CIHS22: Hazard Identification, Assessment and Control Techniques

Faculty: Mr. Baiju G Verghese Mr Hemendra Raval

Course Description : The course focus on the Accident and incident investigation, reporting and analysis .It also let know Types of accidents and performance rates , Hazard identification and risk assessment techniques by using HAZOP, HAZAN, PHA etc. MAH introduced in chapters of the course

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Students will be able to investigate incidents and accidents
- Thus this will help in controlling accidents in workplace .
- Safety Performance Rates calculation are taught henceforth which will help in improvement by comparison
- MAH information ,Gas dispersion, fire and explosion events are helpful in the said category industries in case of Emergency
- Safety Audit ,On Site Emergency plans help in preparation of same in Industries

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Course Description and Learning Outcome

SEMESTER – II

Subject : PS02CIHS23: Physical Aspects Of The Environment

Faculty: Mr. Baiju G Verghese Mr. Mitul Desai

Course Description :The course focuses on Physical Aspects like Noise ,Vibration Heat stress , etc . The following hazards are harmful in the long term and have a chronic effect on the health of workers. The students are taught how to measure such hazards and quantify them afterwards thereby control can be done.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Students can help maintain a hazard free workplace.
- Walk through surveying and quantification be done of hazards and control measures can be placed in Industries
- Worker make aware of Hazards related in work place and the disease in working age time
- Understand thoroughly the limit values and its application.

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Course Description and Learning Outcome

SEMESTER – II

Subject : PS02CIHS24: Safety In Chemical Industry.

Faculty: Mr. Baiju G Verghese Mr. Hemendra Raval

Course Description : There is Inevitable place of Chemical Industry in society hence need of safety in chemical industry is of prime importance. The course focus on types of chemical industries and its hazards and control of Hazards by implementing Safety. The course how Process safety management can be implemented and safety during process storage and transport can be achieved.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Understanding the importance of chemical Industry
- Understanding the importance of identifying the health, hygiene and safety in Chemical Industries
- Making transport of chemicals safe by air water and road
- Importance of Non Destructive testing
- Learn the procedure of safe operation during emergency shut down
- Importance of vessels testing, certification and records in prescribed Forms.

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Course Description and Learning Outcome

SEMESTER – II

Subject : PS02EIHS21: Industrial Visits and Seminars

Faculty: Mr. Baiju G Verghese

Course Description: The course focus mainly on two aspects

1) Industry visits to learn about processes and Industrial Hygiene & Safety Management practice.

2) Practical workshop in industry include all exercise of industrial hygiene and safety

Industrial visits are useful to see and experience the actual implementation of the best hygiene and safety provisions including statutory requirements. The students see the application of various control measures including ventilation system, machine guards, safety devices, personal protective equipment and process controls. Seminar are presented on basis of visits and presentation on no. of topics given.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Help students understand about processes and Industrial Hygiene & Safety Management practice.
- Help students perform various practical's associated with Hygiene.
- Understand Safety practices in Industries.
- Interact with the working community in industries .
- Improvement in presentation skills and other aspects.

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Course Description and Learning Outcome

SEMESTER – III

Subject : PS03CIHS21: Medical Surveillance and Biological Monitoring

Faculty: Dr R R Tiwari, Dr H G Sadhu

Course Description: The course focus Medical surveillance programme for chemicals mentioned in schedule II and III. The second part is on Biological Monitoring and Biomarkers. Importance of Pre, Periodic , Exit Examinations are are taught in the subject .

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Understanding the role Occupational Health Services, Role of medical and non- medical team, required facilities and equipment etc for implementation in Industries
- Importance of Emergency and non- emergency treatment: First Aid etc can be useful in case of non availability of expert medical personnel
- Importance of Ambulance van
- Importance of Bio-monitoring
- Knowledge of Biomarkers help in case studies as such any occur in the industry student is working

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Course Description and Learning Outcome

SEMESTER – III

Subject : PS03CIHS22 : Hazardous Waste Management

Faculty: Mr. Baiju G Verghese

Course Description: The course Introduces to waste, definitions, types, characteristic, physical and chemical properties and how to manage the waste . Course emphasis the need of ETP in various industries by taking all the major Industries in the fourth chapter. The course teaches law regarding to Hazardous Waste as well as the Biomedical waste

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Understand basic definitions related to Hazardous Wastes
- Understand the management of Solid Wastes
- Will be able to manage and run an ETP plant
- Will be able to manage and run an STP plant
- Well aware of laws w.r.t to Hazardous Waste Management.

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Course Description and Learning Outcome

SEMESTER – III

Subject : PS03CIHS23 : Principles of Ergonomics

Faculty: Prof. Purvi D Chauhan

Course Description: Ergonomics comes from the Greek word “ergon “ meaning work, and “nomoi” meaning natural laws, is the science of refining the design of products to optimize them for human use.

The course Introduces to occupational ergonomics and man machine interrelationship. Computers and related products, such as computer desks and chairs, are frequently the focus of ergonomic design.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Understand the Human work physiology
- Give training to workers to avoid work place discomforts
- Use of various techniques for Ergonomics Assessment
- Help in Workstation design, workplace design, office workstations etc
- Understand Tool Designing for better grip etc

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Course Description and Learning Outcome

SEMESTER – III

Subject : PS03CIHS24 : Safety Engineering –II

Faculty : Mr. Hemendra Raval

Course Description: The course introduces to students Safety ,Health and Hygiene aspects to be maintained in the workplaces of various Industries namely Metallurgical Industry , Textile Industry, Construction Industry, Cement Industry, Fertilizer Industry etc .

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Understand Hazards associated to each and every plants
- Understanding of Controls of each plant
- Legislations requirement of various Industries
- Raw materials and process flow chart.
- Safety requirement of each plants.

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Course Description and Learning Outcome

SEMESTER – III

Subject : PS03CIHS25 Legislation on Safety & Health

Faculty : Mr. Baiju G Verghese

Course Description : The course introduces major act related to Industrial Hygiene and Safety. Here Meaning of legislation, legislative process and other legal terminology such as statement of objects and reasons, bill, act, rules, amendment, section rule, schedule and form, preamble, penal section, prosecution, judicial process, judgment, citation etc. are made understood to students. The Factory Act 1948, The Gujarat Factories Rules 1963 etc are some of the major laws taught.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Understand the importance of rights of all the people working in the industries
- Understand how to fill the forms, investigate accidents, reports etc
- Understand the International Labour Organization and its functions
- Understand the Environment Act and various rules made as such
- Understand the implementation of the various laws in industries

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Course Description and Learning Outcome

SEMESTER – III

Subject : PS03EIHS21 :Advanced Safety Management and Engineering
Techniques

Faculty : Mr. Baiju G Verghese, Mr. Hemendra Raval

Course Description : The various topics covered here are Environment Impact Assessment, Pressure Vessel Design, Control system design, Application of reliability for plant design etc. Major aspects related to Biological hazards , Sick Building Syndrome etc are also covered in the course

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Understand the siting of Hazardous Industry
- Learning about the emission and dispersion techniques of various chemicals
- Understanding advanced fire fighting techniques
- Understand the problems of employees in relation to Sick Building Syndrome etc.
- Understanding the Pressure Vessels safety Aspects.

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Course Description and Learning Outcome

SEMESTER – IV

Subject : PS04CIHS21 : OHSAS STANDARD AND ISO 14001:2015

Faculty : Mr. Hemendra Raval

Course Description : The course emphasis on the introduction and development of Occupational Health and Safety standards.

Also focus is on Guidelines for structure and Responsibility of Top Management, middle level management, co-ordinator and employees – Developing procedures, identifying training needs, providing training, documentation of training, Training methodology consultation and communications.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Understanding international standards
- Understanding Indian Standards and its implementation
- Students can implement the standards in Industries
- Students can know various policy guidelines of Environment management Systems
- Students can check and review implemented standards and suggest measures for improvement

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Course Description and Learning Outcome

SEMESTER – IV

Subject : PS04CIHS22: Project Work / Dissertation

Faculty : Mr. Baiju G Verghese

Course Description : Here the students go to various industries for the implementation or the study of Health, Safety ,Hygiene parameters.

A report have to be submitted by each student and a presentation of the same is done at the end.

Learning Outcomes/Capability Development

At the completion of this course, students should be able to

- Get well versed with Industry
- Understand the various work done in the Industries
- Understand the Safety Health and Hygiene parameters implemented in the Industries
- Any suggestion can be made in the report he submit in Industry
- May also get absorbed in Industry were project work done.