REGULATIONS AND SYLLABUS

FOR

DIPLOMA IN HEALTH, SAFETY AND ENVIRONMENT

SUBJECT: DIPLOMA IN HEALTH, SAFETY AND ENVIRONMENT (Dip in HSE)

One year DIPLOMA IN HEALTH, SAFETY AND ENVIRONMENT (Dip in HSE)

OFFERED UNDER THE STATUTE OF

"SPECIALIZED PROGRAMME"

OF

UNIVERSITY OF MYSORE

Credit Based Choice Based Continuous Pattern System

One year distribution of the course structure to be implemented for the

Academic year beginning 2014-2015

DIPLOMA IN HEALTH, SAFETY AND ENVIRONMENT (Dip in HSE)

	COURSE	HOURS/WEEK	CREDIT	L:T:P
1st Semester				
01	SAFETY MANAGEMENT	7	5	3-1-1
02	ENVIRNOMENTAL SAFETY	7	5	3-1-1
03	FIRE TECHNOLOGY	7	5	3-1-1
04	ENGLISH COMMUNICATION	7	5	3-2-0
2nd Semester				
01	CONSTRUCTION SAFETY	7	5	3-1-1
02	INDUSTRIAL SAFETY	7	5	3-1-1
03	DESIGN & INSTALLATION	7	5	3-1-1
04	PROJECT WORK	10	5	0-3-2

IMPORTANT: The one year Diploma in Health, Safety and Environment (Dip in HSE) courses focuses on developing the detailed knowledge about the Health, Safety and Environment (HSE). Candidates must engage with practical training, project works and also other industrial exposure in all related fields. This Diploma in Health, Safety and Environment (Dip in HSE) provides a wide range of industrial relevant Health, Safety and Environment (HSE) training and certifications to become a certified Health, Safety and Environment professional pertaining to any manufacturing, maintenance or service industries.

Regulation for Diploma in Health, Safety and Environment

(DHSE) - 2014

Title – Commencement, Specialized programs, Definition , Eligibility for Admission scheme of instruction

Diploma in Health, Safety and Environment continuous Assessment, Credit & Grades, Classification of results, Provision for appeal

University of Mysore

CBCS and CAGP Regulations for Diploma in Health, Safety and Environment-2014

1. Title-commencement

These regulations shall be called the University of Mysore regulations Choice Based Credit System (CBCS) and Continuous Assessment Grading pattern (CAGP) for Diploma in HSE under the regulation of specialized programmes of University of Mysore. These regulations shall come into force the academic year 2014-2015.

2. Specialized programme

2.1. Diploma in Health, Safety and Environment (DHSE) of One year - 2 semesters

A candidate gets awarded with Diploma in Health, Safety and Environment (DHSE) if he/she earns 40 credits in 2 semesters.

3. Definition

3.1 Course: Every course offered will have three components associated with the teaching-learning process of the course, namely:
(i) Lecture – **L** (ii) Tutorial - **T** (iii) Practical – **P**, where

L stands for Lecture session.

T stands for Tutorial session consisting of participatory discussion / self-study / desk work/ brief seminar presentations by students and such other novel methods that make a student absorb and assimilate more effectively the contents delivered in the Lecture classes.

P stands for Practice session and it consists of Hands on experience / Laboratory Experiments / Field Studies /Case studies / Intensive practice exercises that equip students to acquire the much required skill component In terms of credits, every one-hour session per week of L amounts to 1 credit per semester and a minimum of two hours session of T or P amounts to 1 credit per semester, over a period of one semester of 18 weeks for teaching learning Process.

The total duration of a semester is 20 weeks inclusive of semester-end examination.

A course shall have either or all the three components. That means a course may have only lecture component, or only practical component or combination of any two or all the three components.
The total credit earned by a student at the end of the semester upon successfully completing the course is L + T+ P. The credit pattern of the course is indicated as L: T: P.

If a course is of 5 credits then the different credit distribution patterns in L: T: P format could be

2 : 1 : 1, 0 : 2 : 3, 0 : 3 : 1, 0 : 3 : 2
1 : 1 : 3, 2 : 0 : 3, 1 : 3 : 0, 2 : 0 : 3
1 : 1 : 3, 3 : 2 : 0, 3 : 1 : 0, 3 : 2 : 0

3.2 The concerned BOS will choose the convenient credit pattern for every course based on the requirement.
However, generally, a course shall be of 5 credits.
Different courses of study are labeled and defined in the scheme of instruction for Diploma in Health, Safety and Environment programme.

4. Eligibility for admission

4.1 A candidate whose age is above 17 years and who has completed +2 or equivalent successfully is eligible to apply.

4.2 The intake shall be as approved by the University from time to time.

5. Scheme of Instruction

5.1 A Diploma in Health, Safety and Environment program is of 2 semesters – 1 year duration of 40 credits.
A candidate can avail a maximum of 4 semesters – 2years as per double duration norm, in one stretch to complete Diploma Health, Safety and Environment, including a blank semesters, if any. Whenever a candidate opts for a blank semesters, he/she has to study the prevailing courses offered by the department when he/she resumes his/her studies.

5.2 A candidate has to earn 40 credits for successful completion of Diploma in Health, Safety and Environment with the distribution of credits for different over different semesters as given in **Table 1 for** Diploma in Health, Safety and Environment.

Table 1: Diploma in Health, Safety and Environment

Semester	Course Code	Course Title	Credit Value	L:T: P
1	DHSE/101	SAFETY MANAGEMENT	5	3-1-1
1	DHSE/102	ENVIRONMENTAL SAFETY	5	3-1-1
1	DHSE/103	FIRE TECHNOLOGY	5	3-1-1
1	DHSE/104	ENGLISH COMMUNICATION	5	3-2-0
2	DHSE/201	CONSTRUCTION SAFETY	5	3-1-1
2	DHSE/202	INDUSTRIAL SAFETY	5	3-1-1
2	DHSE/203	DESIGN & INSTALLATION	5	3-1-1
2	DHSE/204	PROJECT WORK	5	0-3-2
			TOTAL :40	

5.3 A candidate can enroll for a maximum of 25 credits per semester including **Dropped** courses of previous semester, if any. However, a candidate may not successfully earn a maximum of 20 credits per semester.

5.4 Generally a full-time candidate may register for 20 credits per semester as shown in **Table 1** may register for additional 5 credits to cover the **dropped** course of previous semester(s) if any.

5.5 If a candidate opts to take a course of 2nd semester along with his regular 1st semester courses provision can be given.(**Applicable only if 2nd sem/ Even semester exams are conducted**).

5.6 If a candidate having a Blank course, opts to take a course of 2nd semester along with a Blank course provision can be given as per regulation.

6. Continuous Assessment Earning of Credits and Award of Grades

The evaluation of the candidate shall be based on continuous assessment. The structure for evaluation is as follows:

6.1 Assessment and evaluation processes happen in a continuous mode. However, for reporting purposes, a semester is divided into 3 discrete components identified as C1, C2, and C3.

6.2 The performance of a candidate in a course will be assessed for a maximum of 100 marks as explained below.

6.2.1 The first component (C1), of assessment is for 25 marks. This will be based on test, assignment, and seminar.
During the first half of the semester, the first 50% of the syllabus (unit 1 and 2) will be completed. This shall be consolidated during the 9th week of the semester. Beyond 9th week, making changes in C1 is not permitted.

The finer split-up for the award of 25 marks in C1 is as follows:
Assignment/brief presentation/seminars……..8 marks for unit 1
Assignment/brief presentation/seminars……..8 marks for unit 2

A review test ……..9 marks for unit 1 and 2

6.2.2 The second component (C2), of assessment is for 25 marks. This will be based on test, assignment, and seminar. The continuous assessment and scores of second half of the semester will be consolidated during the17th week of the semester.
During the second half of the semester the remaining units (unit 3 and 4) of the syllabus will be completed.
The finer split-up for the award of 25 marks in C2 is as follows:
Assignment/brief presentation/seminars……..8 marks for unit 3
Assignment/brief presentation/seminars……..8 marks for unit 4

A review test …… 9 marks for unit 3 and 4

6.2.2.1 The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) will be proposed by the teacher(s) concerned before the commencement of the semester and will be discussed and Decided in the respective Departmental Council. The students should be informed about the modalities well in Advance. The evaluated courses/assignments during component I (C1) and component II (C2) of assessment are immediately returned to the candidates after obtaining acknowledgement in the register maintained by the concerned teacher for this purpose.

6.2.3 During the 19th-20th week of the semester, a semester-end examination of 2 hours duration shall be conducted for each course. This forms the third/final component of assessment (C3) and the maximum marks for the final component will be 50.this C3 50 marks is distributed as 30 marks for theory and 20 marks for viva voice.

Setting questions papers and evaluation of answer scripts.

A. Questions papers (for C3) in three sets shall be set by the expert internal examiner for a course. Whenever there are no sufficient internal examiners, the chairman of BOE shall get the questions papers set by external examiners.
B. The Board of Examiners shall scrutinize and approve the question papers and scheme of valuation.
C. (i) There shall be single valuation for all theory papers by external examiners.
(ii) The examination for Practical work/ viva voice/Project work/ will be conducted jointly by internal and external examiners. However the BOE on its discretion can also permit two internal examiners.

(iii) If a course is fully of (L=0): T :(P=0) type, then the examination forC3 component will be as decided by the BOS concerned.

D. Challenge valuation

A student who desires to apply for challenge valuation shall obtain a photo copy of the answer script by paying the prescribed fee within 10 days after the announcement of the results. He / She can challenge the grade awarded to him/her by surrendering the grade card and by submitting an application along with the prescribed fee to the Registrar (Evaluation) within 15 days after the announcement of the results. This challenge valuation is only for C3 Component.

The answer scripts for which challenge valuation is sought for shall be sent to another examiner. The higher of two marks from first valuation and challenge value shall be the final.

6.2.4 a) In case of a course with only practical / viva Voice component a practical examination will be conducted with both Internal and external examiners. A candidate will be assessed on the basis of knowledge of relevant processes

b) Skills and operations involved

c) Results / products including calculation and reporting.

If external examiner does not turn up then both the examiners will be internal examiners. The duration for semester-end practical examination shall be decided by the departmental council.

6.2.5 If X is the marks scored by the candidate out of 50 in C3 in theory examination, if Y is the marks scored by the candidate out of 50 in C3 in Practical examination, and if Z is the marks scored by the candidate out of 50 in C3 for a course of (L=0): T :(P=0) type that is entirely tutorial based course, then the final marks M in C3 is decided as per the following table:

L.T.P distribution	**Final mark M in C3**
L:T:P	$\frac{[(L+T)*X]+[(T+P)*Y]}{L+2T+P}$
L:(T=0):P	$\frac{(L*X)+(P*Y)}{L+P}$
L:T:(P=0)	X
L:(T=0):(P=0)	X
(L=0):T:P	Y
(L=0): (T=0):P	Y
(L=0): T:(P=0)	Z

6.2.6 The details of continuous assessment are summarized in the following Table:

Component Syllabus in a course Weight age Period of Continuous assessment

C1 First 50% 25% First half of the semester (first 2 units of total To be consolidated by 9th week 4 units)

C2 Remaining 50% 25% Second half of the semester (Remaining units of To be consolidated by 17th week The course)

C3 Semester-end 50% To be completed during 18th-20th Examination (all week Units of the course)

Final grades to be announced latest by 24th week

6.2.7 A candidate's performance from all 3 components will be in terms of scores, and the sum of all three scores will be for a maximum of 100 marks (25 + 25 + 50).

6.2.8 Finally, awarding the grades should be completed latest by 24th week of the semester.

6.3 Evaluation of Project

Right from the initial stage of defining the problem, the candidate has to submit the progress reports periodically And also present his/her progress in the form of seminars in addition to the regular discussion with the guide.

Components of evaluation are as follows:

Component – I(C1): Periodic Progress and Progress Reports (25%)
Component – II (C2): Results of Work and Draft Report (25%)
Component– III (C3): Final Viva-voce and evaluation (50%).
The report evaluation is for 30% and the Viva-voce examination is for 20%

6.4 In case a candidate secures less than 40% in C1and C2 put together in a course, the candidate is said to have DROPPED that course, and such a candidate is not allowed to appear for C3 in that course.
In case a candidate's class attendance in a course is less than 75% or as stipulated by the University, the Candidate is said to have DROPPED that course, and such a candidate is not allowed to appear for C3 in that Course.
Teachers offering the courses will place the above details in the Department Council meeting during the last week of the semester, before the commencement of C3, and subsequently a notification pertaining to the above will be brought out by the Principal of the institute before the commencement of C3 examination. A copy of this notification shall also be sent to the office of the Registrar & Registrar (Evaluation).

6.5 In case a candidate secures more than 40% in C1+C2 but less than 35% in C3, such a candidate may opt to DROP that course or may opt to appear for C3 examination during the subsequent examinations. In case he/she opts to appear for just C3 examination, then the marks scored in C1+C2 shall get continued. Repeat C3 Examinations will be conducted in every semester.

6.6 A candidate has to re-register for the DROPPED course when the course is offered again by the department. A Candidate who is said to have DROPPED project or internship work has to re-register for the same subsequently within the stipulated period. The details of any DROPPED course will not appear in the grade card.

6.7 The tentative / provisional grade card will be issued by the Registrar (Evaluation) at the end of every semester indicating the courses completed successfully. This statement will not contain the list of DROPPED courses.

6.8 Upon successful completion of Diploma in Health, Safety and Environment a final grade card consisting of grades of all Courses successfully completed by the candidate will be issued by the Registrar (Evaluation).

6.9 The grade and the grade point earned by the candidate in the subject will be as given below.

Marks Grade Grade Point (GP=V x G)

P	G	
35-39	4	v*4
40-49	5	v*5
50-59	6	v*6
60-64	6.5	v*6.5
65-69	7	v*7
70-74	7.5	v*7.5
75-79	8	v*8
80-84	8.5	v*8.5
85-89	9	v*9
90-94	9.5	v*9.5
95-100	10	v*10

Here, P is the percentage of marks (P= [(C1+C2) +M] secured by a candidate in a course which is rounded to nearest integer. V is the credit value of course. G is the grade and GP is the grade point.

6.10 A candidate can DROP any course within in ten days from the date of notification of final results. Whenever a Candidate drops a paper; he/she has to register for the DROPPED course as stated in 6.6.

6.11 Overall cumulative grade point average (CGPA) of a candidate after successful completion the required Number of credits (40) is given by **CGPA = ΣGP / Total number of credits.**

7. Classification of results

The Final Grade Point (FGP) to be awarded to the student is based on CGPA secured by the candidate and is given as follows.

CGPA	FGP	
	Numerical Index	**Qualitative Index**
4 <= CGPA < 5	5	PASS CLASS
5 <= CGPA < 6	6	SECOND CLASS
6 <= CGPA < 7	7	FIRST CLASS
7 <= CGPA < 8	8	
8 <= CGPA < 9	9	DISTINCTION
9 <= CGPA < =10	10	

Overall percentage=10*CGPA

Note: A Single Markscard will be issued including both the semesters after clearing all the course.

8. Provision for appeal

If a candidate is not satisfied with the evaluation of C1 and C2 components, he/she can approach the grievance cell with the written submission together with all facts, the assignments, test papers etc, which were evaluated.
He/she can do so before the commencement of semester-end examination. The grievance cell is empowered to revise the marks if the case is genuine and is also empowered to levy penalty as prescribed by the university on the candidate if his/her submission is found to be baseless and unduly motivated. This cell may recommend taking Disciplinary/corrective action on an evaluator if he/she is found guilty. The decision taken by the grievance cell is final.

For every program there will be one grievance cell. The composition of the grievance cell is as follows.

1. The Registrar (Evaluation) ex-officio Chairman / Convener
2. One senior faculty member (other than those concerned with the evaluation of the course concerned) Drawn from the department/discipline and/or from the sister departments/sister disciplines.
3. One senior faculty member / subject expert drawn from outside the University department.

COURSE PATTERN AND SCHEME OF EXAMINATION

FOR

DIPLOMA IN HEALTH, SAFETY AND ENVIRNOMENT

Paper	C1+C2 Marks	Practical / Viva voice C3	Theory Marks C3	**TOTAL**
1st semester				
DHSE /101 Safety Management	25+25	20	30	100
DHSE/102 Environmental Safety	25+25	20	30	100
DHSE /103 Fire Technology	25+25	20	30	100
DHSE/104 English Communication	25+25	20	30	100
2nd Semester				
DHSE /201 Construction Safety	25+25	20	30	100
DHSE /202 Industrial Safety	25+25	20	30	100
DHSE /203 Design & Installation	25+25	20	30	100
DHSE/ 204 Project work	25+25	20	30	100

(1ST SEMESTER)

SAFETY MANAGEMENT

L - T - P
3 - 1 - 1
(3 Hours Lecture per Week)
(2 Hours Tutorial per Week)
(2 Hours Practical per Week)

DHSE/101

Objectives: **Educate students about how to reduce work place hazards and to encourage the standard of safety health & environment programme, so as to aim 0% accidents and 100% safety in different industries in which Safety Management plays an important role . This has the blending mixture of both Learning and Skills.**

UNIT –I (08 Hours): Key elements of a safety and Health Management System- Policy & commitment, Planning, Implementation and Operation, Measuring Performance, Auditing and Reviewing performance Initial Safety and health Management System Review, Safety and health Management System model, safety and Health policy- Developing a workplace Safety and Health Policy , Planning – safety and Health objectives and Targets, performance standards, Implementation and Operation – structure and responsibilities- management responsibilities, individual responsibilities, Safety Consultation.

UNIT -II (08 Hours) : Participation and Representation, Training , Awareness and competence, Communication- Information coming into the organization, Information Flow within the Organization, Information Flow from the Organization,: Document Control : Safety and Health Management System records: Operational Control – Workplace Precautions, Safety And Health training and Competence- Training for Safety and Health:, Identify Training Needs – Organizational Needs, job-related Needs, Individual Needs : Identify Training Objectives and Methods, Deliver Training , Evaluation and feedback, specialist Advice and Services – access to Specialist advice and services, relationships within the Organization , relationships Outside the organization , external specialist safety and safety support.

UNIT -III (08 Hours) : Risk assessment and control- the legal Basis for risk Assessment, key stages of Risk assessment and control- use trained Risk assessors, preparation and Inventory, Identify the hazards, assess the risk , identify Appropriate Action , Risk assessment records and control . A simple Risk estimation example – Hazards, remedial measures, Motivation of employees, Insurance coverage of Industrial plant & personnel.

UNIT - IV (08 Hours) : Stages in plant life and unsafe condition in factories, maintenance & safety, basics safety programming, safety department, Rules and regulation of safety department, Responsibility of management for safety in plant, safe guarding the public, Responsibility of government, social organization and public authorities. Safety activities of the ILO (International Labour Organization)

References:

Guidelines for the Establishment of Safety Management System at Construction Worksites,

Risk assessment- A Practical Guide, 1993, Institution of Occupational Safety and Health, United Kingdom

ENVIRONMENTAL SAFETY

L - T - P
3 - 1 - 1
(3 Hours Lecture per Week)
(2Hours Tutorial per Week)
(2 Hours Practical per Week)

DHSE /102

Objective: **To Train and motivate students in maintaining and improving the quality of the environment and preventing and abating environment pollution. This has the blending mixture of both Learning and Skills**

UNIT-I (08 Hours): Scope and Importance; need for public awareness about our environment; Economic and social security; Environment impact of transportation and Mining.
Environmental impact assessment (EIA) — purpose, procedure and benefits of EIA; Biodiversity and its conservation; Sustainable development. Global warming and greenhouse effect, urbanization, acid rain, ozone layer depletion, nuclear accident and holocaust.

UNIT– II (08 Hours): Case studies, population explosion, family welfare programmers-HI V/AIDS, women and child welfare, Environmental pollution — causes, Effects and control measures of air pollution, water pollution, soil pollution, marine pollution, noise pollution and nuclear hazards, Solid waste management-urban and industrial waste-causes, effects and control measures.

UNIT-III (08 Hours): Renewable and non-renewable natural resources — Forest resource, Water resource, Mineral wealth / resource, Food resource, Energy resources, Growing energy needs, renewable and non-renewable energy sources, Use of alternate energy sources, Land resource and land degradation, Role of an individual in conservation of natural resources, equitable use of resources for sustainable life styles.

UNIT-IV (08 Hours): Role of Government in environment protection, legal aspects of environment protection, NGO initialization, National Committee on environmental Planning (NCP), Environmental Appraisal Committee (EAC), central and state boards for prevention and control of pollution, goals of environment impact policy, case studies, Disaster management floods, earth quake, cyclone, landslides, role of individual in prevention of pollution.

References:

1. Benny Joseph (2005) Environmental Studies — Tata Mc Graw Hill - Publishers.

2. Rao CS (2006) - Environmental Pollution Control — New Age International Pvt. Ltd Publishers.

3. Manjunath D..L (2007) - Environmental Studies - Pearson Education Publishers.

4. Yaji R.K (2006) - Text Book of Environmental Studies - United Publishers.

5. Centre for Environmental Education (1990) - Essential learning's in Environmental education.

6. Venugopal Rao P (2006) - Principles of Environmental Science and Engineering — Prentice Hall.

FIRE TECHNOLOGY

L - T - P
3 - 1 - 1
(3 Hours Lecture per Week)
(2Hours Tutorial per Week)
(2 Hours Practical per Week)

DHSE/103

Objective: **To create awareness among students about Fire safety and Fire prevention and also guide them to become safety officers with modern techniques of fire fighting. This has the blending mixture of both Learning and Skills.**

UNIT-I (08 Hours) : Fire, change of state and latent heat, thermal expansion of solids, liquids and gases. Transmission of heat, combustion, Fire tetrahedron, and combustible solid, liquids and gases. Classification of Fire and different fire extinguishing methods, portable fire extinguishers, types and operating procedure. Fundamental Principles of Hydraulics, Atmospheres pressure and suction lift, use of Nozzle discharges. Advantages and disadvantages of Centrifugal pumps. Types of pumps and primers. Operation of pumps and primers, Types of ladders and trolleys. Pitching and climbing hints.

UNIT-II (08 Hours) : Maintenance of ladders and trolleys. Design of turntable ladders, water tender and special equipment. Types of water relay system. Arrangements of water relay system. Capacity of hoses, ropes, lines and knots. Hose reel and hose fittings. Types and construction and maintenance of hoses. Hose drying cabinets. Repairing of hoses. Hose fittings, Branches and nozzles. Collecting head, Suction hose fittings and stand pipe. Branches, Adaptors. Misillaneous hose fitting, Hose clamp.

UNIT III (08 Hours) : Strainers and maintenance of hose fitting. Foam and foam making equipments, Synthetic based foam concentrates, Foam concentration and induction and ignition equipments. Pressure control valve. Fire protective clothing, technical description and specifications of protective clothing. Breathing apparatus, types of breathing apparatus, care and maintenance of breathing apparatus. Life line signals , small gears and hand tools, conventional tools, non conventional tools, non powered equipments. Maintenance of small gears.

UNIT-IV (08 Hours): Practicals: Conducting wet and dry drills using various Nozzles, Identification Rehearsals of Portable extinguishers, Filling of DCP powder in Portable Extinguisher and wearing Protective clothing, Mock drills, Positioning of ladder and Demonstration of Ropes and lines, Laying out and Rolling of fire hoses, Priming of water from fire tenders using suction hose, static tank Hydrant fire drills, Site visit.

References:

1. Fire Protection And Prevention

By: Brendra Mohan San

Publishers: UBS Publishers & Distributors Pvt Ltd.

Edition: 1st Edition

Year of Publication: 2008

2. Hand Book Of Fire Technology

By: R.S. Gupta

Publishers: Orient Longman Publishers

Edition: 2nd Edition

Year of Publication: 2005

3. Hand Book Of Fire And Explosion Protection Engineering

By: Dennis P Nolan

Publishers: Crest Publishing House

Edition: 1st Edition

Year of Publication: 2007

ENGLISH COMMUNICATION

L-T-P
3-2-0
(3 Hours Lecture per Week)
(4Hours Tutorial per Week)

DHSE/104

Objective: **English has truly become a global language and the primary medium of communication in the fields of engineering, technology, research and development. Learning the language for everyday communication is among the basic needs of a technical professional in this era of globalization.**

UNIT- 1 (8 Hours): Lessons, Parts of speech, Countable and uncountable nouns, Use of some, any etc.

UNIT- 2 (8 Hours): Main and Aux, Verbs, Uses of Tenses, Voice, Interrogatives.

UNIT- 3 (8 Hours): Negatives, Prepositions, Question Tags, Use of adverb too.

UNIT- 4 (8 Hours): Use of idioms and phrases, story from outlines, Developing notes into a paragraph, Comprehension of unseen Passage, summarizing.

References:

English communication – By- Orient Black Swan

(2ND SEMESTER)

CONSTRUCTION SAFETY

L - T - P
3 - 1 - 1
(3 Hours Lecture per Week)
(2Hours Tutorial per Week)
(2 Hours Practical per Week)

DHSE /201

Objective: **Construction industry in India is very large in size and the second largest sector in terms of employment. Construction is a peculiar industry and is relatively hazardous. The safety of construction workers and their protection against injuries is the most important social concern .This subject deals with how construction projects can be made reasonably safe by proper advance planning and excavation techniques. This has the blending mixture of both Learning and Skills**

UNIT-I (08 Hours): Safety during project construction,. Training to project staff and operation staff, stages of project construction, safety during receiving, unloading, shifting and storage, safety guidelines for storage, general safety facilities at construction sites, interface between civil and errection works, definition on construction safety, soil classification system, general precaution, hazardous atmosphere and materials, emergency rescue equipment, exhaust gases.

UNIT II (08 Hours) : Hydraulic shoring for trenches, timber shoring for trenches. Safety in cutting and brazing, gas welding oxy acetylene equipment and use, gases- storage of cylinders, handling of cylinders, Inspecting equipment, Projective measures for electric arc welding, welding and cutting in tank vessels and drums, confined spaces, personal protection, health hazards. Safety in Concrete, Concrete forms and shoring, reinforcing steel, concrete placement, general requirements for vertical and tubular welded frame shoring, tube and coupler shoring, vertical slip forms, electrical safety in constructions, work on live equipment, over head and underground cables, safety in use of power tools, hand tools, pneumatic tools, electrically operated tools, cartridge, individual tools and precautions.

UNIT III (08 Hours) : Form works-Types, assembling and dismantling and their safety. Scaffolding, Types of scaffold, design and inspection of scaffold, terminology of scaffold, scaffold construction materials, scaffold erection procedure, safety precaution while erecting scaffold, dismantling of scaffold, material handling, investigation of scaffold accident, causes of hazard in scaffold, safety in scaffold, provision of scaffold for the building and other construction. Study of safety standards and ILO (International Labour Organization) recommendation. Case studies (Accidents in different construction sites.)

UNIT-IV (10 Hours) : Practicals: Visit to construction site ,Erecting and dismantling scaffolding for single storied , Multi storied buildings ,Demonstration of Safety harness and ladders ,Showing how to use power tools and hand tools safely, Conducting Tool box meeting, Mock drill (Falling from height) ,Awareness about site evacuation plan ,Safe way to material handling ,How to wear personal protective equipments

References:

1. Electrical Safety, Fire Safety Engineering and Safety Management

By: Rao.S /Saluja H.L.

Publishers: Khanna Publishers

Year: 1998

Edition: First edition

2.Safety Management In The Construction Industry

Publishers: A Guide Published by National Institute of Construction

Year: 2005

Edition: Second edition

3.Construction Technology

By: Grundy. J.

Publishers: Viva Books Pvt. Ltd.

Year: 2006

Edition: First Edition

INDUSTRIAL SAFETY

L - T - P
3 - 1 - 1
(3 Hours Lecture per Week)
(2Hours Tutorial per Week)
(2 Hours Practical per Week)

DHSE /202

Objectives: **Educate students about how to reduce work place hazards and to encourage the standard of Safety ,Health & Environment programme , so as to aim 0% accidents and 100% safety in different industries in which Industrial Safety plays an important role. This has the blending mixture of both Learning and Skills.**

UNIT-I (08 Hours) :Importance of Safety, health and environment. Health safety and environmental policy, fundamentals of safety, classification of accidents, Managements responsibility, objectives of safety management, National safety council, Employees state insurance act 1948, approaches to prevent accidents, principles of safety management, safety organization, safety auditing, maintenance of safety, measurements of safety performance, industrial noise and noise control, Industrial Psychology, Industrial accidents and prevention. Introduction to OSHAS 18001 AND OSHA.

UNIT II (08 Hours) : Process safety management (P.S.M) as per OSHA, legal aspects of safety, safety with respect to plant and machinery, the explosive act 1884, Petroleum act 1934, personal protective equipment, classification of hazards, protection of respiratory system, work permit system, hazards in refineries and process plants, safety in process plants, pollution in some typical process industry. Safe working practices, housekeeping, safe working environment, safety device and tools, precaution in use of ladders, safety instruction during crane operation, safety instruction for welding, burning and cutting and gas welding equipment, electrical safety, case studies, safety in use of electricity, electric shock phenomena, Occurrence of electric shock, medical analysis of electric shock and its effect, safety procedures in electric plants, installation of Earthing system,

UNIT III (08 Hours): Safety in hazardous area, hazard in industrial zones, classification of industrial Enclosures for gases and vapors. Mechanical, Chemical, Environmental and Radiation hazards, Machine guards and safety devices, slings, load limits, lifting tackles and lifting equipment, hydrostatic test, Chemical hazards, industrial toxicology, toxic chemicals and its harmful effects on humans, factors influencing the effect of toxic materials, Units of concentration, control measure, environmental hazards, devices for measuring radiation, safety analysis and risk analysis, risk management, First aid, Safety measures to avoid occupational diseases.

UNIT-IV (08 Hours) Practicals: Demonstration and training how to use breathing apparatus, Emergency evacuation drill,Train students how to rescue employees using emergency rescue equipments inside confined space. With the help of gas detector train students check the level of oxygen and other, Gases in industries,Training of using of windo meter to measure speed level of wind, Train students use noise level meter and find out different level of noise of different equipments and teach them how to be safe, Train students how to use personal protective equipment ,First Aid training and demonstration.

References:

1. Industrial safety management

By: L.M. Deshmukh

Publishers: Tata Megraw Hill ,New Delhi

Year: 2006

Edition: First

2. Industrial safety health and environment Management system

By: R.K. Jain & Sunil S. Rao

Publishers: Khanna Publishers

Year: 2008

Edition: Second

DESIGN AND INSTALLATION

L - T - P
3 - 1 - 1
(3 Hours Lecture per Week)
(2Hours Tutorial per Week)
(2 Hours Practical per Week)

DHSE /203

Objectives: **To familiarize students with the design, installation, working and use of different types of Fire protection systems for low and high residential, commercial and public buildings. This has the blending mixture of both Learning and Skills.**

UNIT-1 (08 Hours): Fire extinguishing appliances. Selection, requirements, installation and maintenance of hand appliances. Mechanically driven fire engines and trailer pumps. Hydrant system, pumps, Fuel System, Fixed monitors, Hose pipes and Nozzles, Maintenance of pumps, Hydrants hose pipes and nozzles. Sprinkler system, installation of sprinkler system, piping and fittings. Pressure gauges, Installation of control valves, Maintenance of sprinkler installation, Fire protection requirements for buildings and riser system. Classification of buildings based on occupancy. Fire protection, static water storage tanks. Preparation of plans, Signs and symbols used in the drawing, Drawing instruments and their uses.

UNIT-II (16 Hours) : Fire alarm Systems, Automatic fire detection, Principles of automatic fire detection, Types of system, definition of detector, Classification of detector, Success or failure operation, Fire Products, smoke detectors, optical detector, Radiation detector, infra red detector, ultra violet detector, heat detector, advantages and disadvantages of detector.

UNIT-III (08Hours): Linear heat detectors., Radio based systems. Automatic fire detection circuits. Theory of open circuit and closed circuit, Detector and alarm circuits. Wiring and power supplies. Control and indicating equipment, general, Zones, Power supplies, Faults, Developments, Monitoring the system, Maintenance, Visual display, Examples of control and indicating equipment, Event location message, Remote manned centre. Detector positioning , Manually operated fire alarms. Block diagram of a fire alarm systems.
Case studies (examples of fire hazard in India).

UNIT-IV:(08 Hours) : Practical: Hydrant fire drills, study operation, Maintenance ,Visit to sprinkler fitted buildings/houses. Study of Fire Protection plan and drawings Emergency Evacuation mock drills, Periodically showing the method of operation by dismantling and assembling, smoke detector and sprinkler,Practical explanation by showing circuit and Fire alarm, Site Visit to visualize the installation of Fire extinguishing appliances in multi storied buildings, hotels etc..

References:

1. Fire Safety In Building

By: V.K. Jain

Publishers: New Age International Publishers

Edition: 2nd Edition

Year of Publication: First Print – 1996 Re-print – 2002

2. Electrical And Mechanical Service In High Rise Buildings ,Design and Estimation Manual

By: A.K. Mittal

Publishers: CBS Publishers &Distributors

Edition: 1st Edition

Year of Publication: 2007

3. Design of Water Based Fire Protection Systems

By: Robert M. Gagnan

Publishers: South Western Dujebury

Edition: 1st Edition

Year of Publication: 2006

ASSESSMENT AND EVALUATION

In order to provide a holistic profile of the student, the following methods of assessment will be used

1. Continuous assessment [C1+C2]
    - Class participation
    - Assignments
    - Project Report
    - Quick test/progress test
    - Discussion and Seminar

2. Semester end Examination[C3]
   Part I: Written Examination
   Part II: Viva voice/Practicals