PGDISM

Course Curriculum for

Post Graduate Diploma in Industry Safety Management

Through Distance Education

Directorate of Distance Education
Guru Jambheshwar University
of Science & Technology
Hisar-125001

APPENDIX-XII

REGULATION FOR THE POST-GRADUATE DIPLOMA IN INDUSTRIAL SAFETY MANAGEMENT

(1) A graduate in any discipline shall be eligible for admission to the examination in Diploma in Industrial Safety Management of the University.

(2) The duration of the courses shall be one year commencing from the date as may be announced in this regard from time to time.

(3) The prescribed courses of studies will consist of the following subjects grouped into 8 papers with one hundred as full marks in each paper.

1. Paper -I	Principles of Industrial Safety	100 marks
2. Paper -II	Industrial Toxicology, Environment Pollution and Occupational Health	100 marks
3. Paper -III	Industrial Hazards and Accidents	100 marks
4. Paper -IV	Safety Management and Organisation	100 marks
5. Paper -V	Safety Statistics and Accidents Inspection	100 marks
6. Paper -VI	Safety Legislation and Codes and Workmen's Compensation Pertaining to Factory, Boilers and Their Administration	100 marks
7. Paper -VII	Computer Applications(Theory: 50 Practical:50)	100 marks
8. Paper -VIII	Dissertation on Field Work	100 marks
9. Paper -IX	Comprehensive Viva-Voce	100 marks

(4) The courses of studies may be reviewed from time to time by the University.

(5) The examination shall be held once every year at such place and time as fixed by the University.

(6) In order to qualify for appearing in the examination a candidate must have completed the field work training and submitted a report thereon.

(7) In order to pass the examination, a candidate must obtain at least 40% marks in each paper and in aggregate.

(8) Each successful candidate shall receive a Diploma in Industrial Safety Management in the prescribed form which will indicate the class in which he was placed.

(9) Each candidate seeking admission to the course and to the examination shall pay such fee and other charges as may be prescribed from time to time in this regard.

(10) The Directorate of Distance Education of the University will arrange a two weeks personal contact programme (PCP) for the candidates to impart interactive learning in the papers.

PAPER-1
PRINCIPLES OF INDUSTRIAL SAFETY

(a) Meaning, needs and importance of Industrial safety.
(b) Philosophy of accident prevention, safety – yesterday, today and tomorrow – a historical review.

Causes of Industrial accidents –unsafe acts and conditions – multiple causation vs.Facts.

Cost and consequence of accident-types of economic losses-injuries and fatalities.

Basic principles of loss control.

Safety and Productivity

Welfare and Safety

Safety Movements in some industrially advanced countries-Safety movement in India

(a) Responsibilities of management, workers and trade unions.
(b) Responsibilities and roles of society, state, international agencies etc.

(a) System analysis including job safety analysis, operational hazards analysis, failure mode analysis and hazards analysis.
(b) Concept of risk management including total loss control, critical incident, product safety etc.

10. Meaning, objectives and importance of ergonomics-fitting men with machines and machines with men-human activities and control-work- place designs and physical environment.

Books recommended

1. H.W.Heirnich D Petersen and N.Roose. Industrial Accident Prevention.Mc. Graw Hill Book Co.New York 1980.
2. Dan Peter. Techniques safety Management. McGraw Hill Book Co. New York, 1978.
3. I.L.O.Accident Prevention: A Worker's Education Manual .I.L.O.Geneva. Second Edition. 1980.
4. I.L.O. Encyclopaedia of Health and Safety, I.L.O., Geneva.
5. Government of India. Report of the Royal Commission on Labour 1931.
6. Government of India. Report of the National Commission on Labour, 1969.

PAPER-II
INDUSTRIAL TOXICOLOGY, ENVIRONMENTAL POLLUTION AND OCCUPATIONAL HEALTH

1. Basic human Physiology and Pathology in relation to work- meaning of work, physiology and psychology of work – Stress factor – Oxygen consumption.
2. Working environment-man and the environment including ecology and ecosystems- Elements of working conditions i.e. noise, ventilation, lighting, temperature, humidity etc, and effects on safe performance in industry.
3. work Load – physical and mental work- physical work- light and heavy work-monotonous and non-monotonous work-factors governing work load-on Mental work.
4. Fatigue-meaning and causes of fatigue- production curve-control and remedies of fatigue.
5. Industrial toxicology-occupational diseases by certain chemicals and physical and biological agents- with stress on emergency antidotes.
6. Prevention and control of occupational diseases- environmental, personal and medical control.
7. Environmental pollution-Definition of pollution- pollution of water resources land and air- catastrophic pollution affecting surroundings-basic approach for prevention and control of different type of pollution.

Books recommended

1. I.L.O.Encyclopaedia of Health and Safety, I.L.O. Geneva.
2. J.R.Redley(Editor) Safety at Work, Butterworths, London.
3. W.Hammer, Occupaional Safety Management & Engineering, Prentice Hall, London, 1984.
4. L.Levis, Stress in Industry: Causes, Effects and Prevention, I.L.O.Geneva, 1984.

PAPER-III
INDUSTRIAL HAZARDS AND ACCIDENTS

1. Principles of accident prevention related to (a) machine guarding, hand tools, portable electrical apparatus, portable ladders, acetylene cylinders etc; (b) fire and explosions (c) other protective measures including good house keeping, working clothes, personal protective equipments etc.
2. Mechanical hazards related to cutting and tearing, sheering, crushing, breaking welding, staining etc. machine guards and devices-precautionary measures.
3. Chemical hazards- Reactors, decomposition, association, dissociation and resultant hazards including fires, explosion, detonation etc.-prevention and control.
4. Electrical hazards related to shocks bare conductors, electrical insulation failure, equipment failures, static electricity, lighting and over heating due to electric power, circuit and equipment protection-prevention and control.
5. Inflammable and volatile materials including fuels, oxidizers, gasses, liquids fuels flammable and combustible liquids, ignition etc. and control of fires, explosion and detonations.
6. Hand tools, portable tools, power tools etc. and resultant hazards-hazards related to strings, ropes, lifting tackles, hoisting etc. hazards related to manual and mechanical handling of materials – prevention and control.
7. Pressure hazards related to pressure vessel rupture, discharges from safety valves, dynamic pressure hazards, hoses, water hammers, leaks etc.- prevention and control.
8. Building and Construction – Hazards related to foundation and excavation, walling, lift well, demolition, roofing etc.-prevention.
9. Personal protective equipments – Safety equipments, appliances, instruments, protective clothing etc.- use, storage, facilities and maintenance.
10. Internal transport and safety.

Books recommended

1. W.Hammer, Occupational Safety Management and Engineering, Prentice Hall, London, 1981.
2. J.R.Ridley(Editor), Safety at work, Butterworths, London.
3. Dan Petersen, Analysing Safety Performance, Gardens STEM Press, New York, 1980.
4. I.L.O.Encyclopaedia of Health and Safety, I.L.O. Geneva.
5. Dr. N.K.Tarafdar & Mr. K.J.Tarafdar- Industrial Safety Management.

PAPER IV
SAFETY MANAGEMENT AND ORGANISATION

1. (a) Meaning of safety management at different levels.
   (b) Basic approaches to safety management including work centered, employee centered and work-cum-employee centered approaches, Research design,layout,site selection etc.
   (c) Behavioural sciences and safety – Past and current factors influencing safe behaviour.
2. Planning for Safety Management
   (a) Meaning and basic considerations
   (b) Formulation of Safety programme-meaning content and nature-how to make it acceptable
   (c) Problem analysis and decision making
3. Organisation for Safety Management
   (a) Systems of organization-Role of Safety department and safety specialists in the organization – staff or line.
   (b) Responsibilities of Safety department, Fire Protection department, Medical department, Maintenance department, purchasing department etc.in Safety Management.
   (c) Responsibilities of plant managers, foremen, supervisors, full-time and part-time safety specialist, employees and others.
4. Functions of Safety Department
   (a) Motivating for safety (i) influences of past factors including personality, values and beliefs and life change units on safe behaviour, (ii) organization at climate influencing safe behaviour,(iii) safety performance analysis, (iv) Maslow's Need Hierarchy Theory, Herzberg's Hygiene and Motivation Theory, Vroom's Expectancy Theory, Argyn's Conflict Theory of Motivation and Safety
   (b) Safety leadership (i) Powers of safety leaders (ii) Leadership styles: X and Y theory, Managerial Grid, Likert's theory, (iii) Discipline and safety
   (c) Communications in safety (i) Importance and types, (ii) Making verbal communications effective, (iii) Effects of non-verbal communications (iv) small group and audience communications.
   (d) Campaigns related to Audio-visual, consciousness raising, competition and awards, translating managerial decision etc.
   (e) Safety training (i) Importance and steps in developing safety training programmes, (ii) Supervisory training (iii) Employee safety training for new employees and continuous training.

(f) Safety committees (i) Forms of workers participation and their effectiveness (ii) consideration in organizing of different types of committees, (iii) composition and functions of different types of committees (iv) Function of Chairman, Secretary and Members of Safety committees.

5. Industrial Relations and Safety
   (a) Role of trade unions in safety
   (b) Collective bargaining and safety in India
   (c) Workers Participation in Management in India and Safety.

Books recommended:

1. Dan Petersen, Techniques of Safety Management, McGraw Hill Book Co. New York, 1978.
2. Dan Petersen, Analysing Safety Performance, Garland STEM Press, New York, 1980.
3. D.K. Denton, Safety Management: Improving Performance, McGraw Hill Book Co.New York, 1982.
4. Maurice Bryant, Success with Occupational Safety Programme, I.L.O.Geneva, 1984.
5. H.W. Heinrich, D. Petersen and N. Roose, Industrial Accident Prevention, McGraw Hill Book Co., New York, 1980.

PAPER- V
SAFETY STATISTICS AND ACCIDENT INSPECTION

1. Definition, application and limitation of statistics- Explanations, sample, parameters, statistics etc.
2. Formation of frequency distribution – diagrammatic and graphical representation.
3. Measures of central tendency and dispersion – Moments including P1p2 Skewness and Kurtisis and their measures and co-efficients.
4. (a) Correlation: Types of correlation, product moments and rank correlation coefficients.
   (b) Regression : Method of least squares, regression equations.
5. Probability and probability distribution : Meaning of probability and explanation of various terms used in its definition- Addition and multiplication laws of probability- Random variable and expectation- Binomial, Poisson and normal distribution and their main properties.
6. Time series Analysis: Definition and components of time series-methods of determination of trend and seasonal components.
7. Test of Significance:
   (a) Large sample tests involving proportion, two proportion singly and two means-small sample test-Application of X, T & F distributions.
   (b) Control Charts: Use of X,R,P & C Charts.
8. Inspections mode and periodicity- inspections by competent persons according to the provisions of law.
9. Accident investigation technique-reporting technique of following up recommendations.
10. Safety check list and safety permit system-their need and usefulness.

Books recommended

1. Denton, D.K.: Safety Management: Improving Performance, McGraw Hill Book Co, New York.
2. Gupta, S.C.: Fundamentals of Statistics, Himalaya Publishing House, Mumbai.
3. I.L.O. Office: Encyclopedia of Occupational Health and Safety, I.L.O.Geneva.
4. Levin, R.I and Rubin, D.S.: Statistics for Management, Prentice Hall of India.
5. Petersen, Dan: Techniques of Safety Management, McGraw Hill Book co, New York.

PAPER-VI
SAFETY LEGISLATION, CODES AND WORKMEN'S COMPENSATION PERTAINING TO FACTORIES, BOILERS AND THEIR ADMINISTRATION

1. Safety and Health provisions of the Factories Act 1948, including Bihar Factory Rules.
2. Safety provisions of Boilers Act 1923.
3. Administration of Factories Act 1948, and Boilers Act, 1923. Roles of Central and State Governments inspectorate of factories. Director General, factory advisory service-guide to the safety provisions of the Factories Act-mode of passing industrial risk on the other parties-insurance.
4. Workmen's Compensation Act, 1923- provisions of work injuries and benefits in the Employee's State Insurance Act, 1948.
5. Occupational diseases as specified in the Factories Act, 1948, Workmen's Compensation Act 1923 and Employees' State Insurance Act, 1948 – guide to recognition and modification of occupational diseases issued by the chief factory advisor.
6. Role of I.L.O. in promoting uniform safety standards-conventions and recommendations related to safety-other activities of the I.L.O.in the field of safety promotion.
7. Hazards and codes, rules and regulation in specific industries.
   (a) Iron and Steel industry
   (b) Engineering industries
   (c) Chemical industry
   (d) Codes in construction industries and national building code.

Books recommended

1. Dr.V.G.Goswami, Labour & Industrial Laws, Central Law Agency, Allahabad.
2. A.M. Sharma, Industrial Jurisprudence & Labour Legislation, Himalaya Publishing House, New Delhi.
3. Bihar Factory Manual, Malhotra Publications
4. E.S.I. Act, 1948.
5. Workmen's Compensation Act, 1923.

PAPER-VII
COMPUTER APPLICATIONS IN SAFETY MANAGEMENT

1. Introduction to Computers

This course provides introduction to computers and computing. Topics include the impact of computer on society, ethical issues, hardware/software applications, including word processor, spreadsheets, database, the internet and operating systems. Upon completion, students be able to demonstrate an understanding of the role and functions of computers and use of computer to solve problems.

(a) Spreadsheet 1 & II

This course introduces basic spreadsheet design and development. Topics include writing formulas, using functions, enhancing spreadsheets, creating charts, and printing. The second part covers advance spreadsheet design and development. Topics include advanced functions, charting, macros, database and linking.

(b) Word Processing

This course introduce word processing concepts and applications. Topics include preparation of a variety of documents and mastery of specialized software function. Upon completion students should be able to work effectively in a computerized word processing environment.

(c) Database Concept and Applications

This course introduce database design and creation using a DBMS product. Topics include database terminology, usage in industry, design theory, types of DBMS models, and creation of simple table, queries, reports and forms.

(d) Business Presentation

This course provide hands on experience with a graphic presentation package. Topics include terminology, effective chart usage, design and layout, integrating hardware components, and enhancing presentations with text and graphics.

2. Helpdesk, Analysis & Design

This course examines established and evolving methodologies for the analysis, design and development of a helpdesk system emphasis is placed on business systems characteristics, managing information systems projects, prototypes, CASE tools, and system development life cycle phase.

Books recommended

1. B.P.B- MS Office-2000, Business Promotions Bureau, Delhi.
2. TAXALI – Fundamentals of Software
3. Object Orientation through C++-Parimala N, Mcmillan
4. Systems Analysis and Design – Don Yeaters, Maura Shields and David Helmay.
5. *Programming Language – Programming* in CS, C++-Schaum Series(TMH) Tata McGraw Hill, New Delhi.
6. Basic Commands of MS DOS and UNIX Operating System- Microsoft Windows NT 4.0
7. Data Structures Using C and C++- Yedidyah Langsam, Moshe J. Augenstein, Aavon M. Tenenbaum, Prentice Hall of India New Delhi
8. Lotus 123- A Guide and Workbook- E Bala Guruswamy, M.L.Saikumar, M.S. Sarma, McMillan

PAPER – VIII
DISSERTATION ON FIELD WORK

A student must undergo at least one month practical training before the diploma is awarded. During this period, investigations into various aspects of safety in factories and other organizations will be undertaken under the guidance and supervision of the faculty members. After the training is over, a written report will be submitted for evaluating the candidate's work during the period. This report will carry 100 marks.

PAPER-IX
COMPREHENSIVE VIVA-VOCE

The viva-voce examination carrying 100 marks will be held after a student has complied with all the above requirements of the course. While the viva-voce examination will be a comprehensive one, special emphasis will be placed on the subject of field-work.