

## OCCUPATIONAL SAFETY, HEALTH, AND ENVIRONMENT (OSHE)

**111. Introduction to Occupational Safety and Health.** Credit 3 hours. This course introduces general safety and health concepts. Major topics include: occupational safety and health terms, historical developments, program concepts and terms, legislative overview, including worker's compensation law, problem identification, hazard recognition, evaluation and control concepts, and an introduction to measurement and evaluation.

**112. Design of Hazard Controls.** Credit 3 hours. Prerequisites: Current enrollment or prior credit for OSHE 111. This course studies the application of scientific and engineering principles and methods to achieve optimum safety and health conditions through the analysis and design of process, equipment, products, facilities, operations, and environments. Major topics include product design, plant layout, construction, maintenance, pressure vessels and piping, mechanical systems, materials handling and storage, ventilation, power tools, electrical equipment, and transportation vehicles and systems.

**121. Safety and Health Program Management and Administration.** Credit 3 hours. Prerequisite: Enrollment in or prior credit for OSHE 111. This course studies the application of proven management principles and techniques to the management of safety and health and loss control programs. Major topics will include; planning, organizing, budgeting, resourcing, operating, implementing, and evaluating safety functions.

**141. [241]. Principles of Industrial Hygiene & Toxicology.** Credit 3 hours. This course introduces the basic industrial hygiene principles of anticipation, recognition, evaluation, and control of workplace conditions as they relate to occupational health. Major topics include: a variety of occupational hazards including air contaminants, chemical hazards, biological hazards, and physical hazards.

**231. Safety Laws, Regulations, and Standards.** Credit 3 hours. This course studies the development processes, sources, and applications for minimum safety requirements established by laws, regulations, standards, and codes. Major topics will include OSHA General Industry and Construction Standards, the enforcement of safety standards, and the role of NIOSH and ACGIH in the safety movement.

**242. Ergonomics.** Credit 3 hours. Prerequisite: Enrollment in or prior credit for Mathematics 241 and OSHE 141[OSHE 241]. This course explores ergonomic design principles which involve the planning and adapting of equipment and tasks to promote the comfort and efficiency of workers. Major topics include: human characteristics, physiology, and anthropometry and the application of these principles to workstations, tool design, and material handling procedures.

**251. Environmental Laws and Regulations.** Credit 3 hours. This course is an introduction to federal and state environmental regulations which impact industry. Major topics include hazardous waste management, disposal and cleanup, prevention of air, water, and soil contamination and environmental program management.

**261. Fire Protection and Prevention.** Credit 3 hours. This course introduces the basic principles of fire and fire prevention in the work place. Major topics include: evaluating existing and planned facilities from a fire and explosion standpoint, and applying the basic principles of hazard recognition, evaluation, and control when developing fire prevention and emergency response activities.

**311. Safety & Health Program Development.** Credit 3 hours. This course presents the key elements necessary to develop or to assess occupational safety and health programs. Major topics include management commitment and employee involvement; worksite analysis, hazard correction and control; training, and evaluation.

**322. Behavioral Aspects of Safety.** Credit 3 hours. Prerequisite: Psychology 101. This course will introduce students to the application of scientific research based principles and methods to bring about change in the work culture through attitude, behavior, and environmental conditions. Specific topics will include traditional approaches and philosophies for improving safety, environmental effects, incentives, developing and building cultural change, identifying critical behavior, developing checklists, giving and receiving recognition and measuring performance.

**323. Product Safety and Liability.** Credit 3 hours. This course examines the importance of considering the safety of a product in its ultimate use. Major topics include: aspects of product design, intended and improper use, and potential injury mechanisms. It uses classic product liability case studies to provide practical application of the principles learned. It also studies manufacturer liabilities through injury tort actions.

**341. Field Methods of Industrial Hygiene and Toxicology.** Credit 3 hours. Prerequisites: Mathematics 241 and OSHE 141[OSHE 241]. This course presents an examination of the methods used by the industrial hygienist for the identification and assessment of health hazards in the workplace. Major topics include: establishment and use of methodologies to sample and evaluate exposures to air contaminants (gases, vapors, aerosols, and particulates), microorganisms and allergens, noise, heat, and cold stress, electrical and magnetic radiation, and ionizing and ultraviolet radiation. The course also includes equipment use, maintenance, and calibration.

**381. [281]. Safety in Chemical and Process Industries.** Credit 3 hours. Prerequisites: Enrollment in or prior credit for Chemistry 101 and Physics 191. The course introduces the fundamentals of chemical and process industry safety. Major topics include: toxic, fire, and pressure hazards inherent in chemical plants and petroleum refineries, and the methods used to identify, assess, and eliminate those hazards. It also introduces students to federal safety regulations for process safety management.

**382. [282]. Construction Safety.** Credit 3 hours. Prerequisites: Enrollment in or prior credit for OSHE 111 and OSHE 121. The course studies the application of management principles, communication and human relations factors, safety/health rules, industry and federal standards, accident investigation, and the job planning phases in the construction environment.

**421. [321]. Measurement of Safety Performance and Accident Investigation and Analysis.** Credit 3 hours. Prerequisite: Enrollment in or prior credit for Mathematics 241. This course presents methods to objectively evaluate a company's safety progress. The course covers two distinct topics: (1) measuring safety performance, and (2) incident investigation and analysis. The first segment of the course addresses ways of measuring safety performance objectively and subjectively using safety audits, inspections, observations, performance appraisal systems, and injury/illness statistics. The second segment of the course addresses the causes of accidents, systematic ways of conducting investigations, documenting the findings, causes and other significant data, and drafting recommendations.

**424. [324]. System Safety Methodologies.** Credit 3 hours. Prerequisites: Mathematics 241, OSHE 111, and OSHE 121. The course presents the concepts of Risk Management and Loss Control through the use of systematic approaches to hazard anticipation,

identification, evaluation and control. Major topics include: an introduction to qualitative methods of evaluating the hazards and risks associated with systems, processes, equipment, and other entities. It also includes a review of techniques for mitigating or managing identified risks.

**441. Industrial Toxicology.** Credit 3 hours. Prerequisites: General Biology 151, Zoology 241, and OSHE 141[OSHE 241]. This course examines the effects of industrial toxicants on the human body. Major topics include: the discipline of toxicology, acute and chronic exposures and effects, routes and characteristics of exposures, target organs and systems, dose and response, and carcinogenesis. It also discusses the toxic characteristics of various classes of toxic materials.

**451. Hazardous Materials Management.** Credit 3 hours. Prerequisite: OSHE 251. This course examines acceptable policies, procedures, and methods for the use of hazardous materials, and the disposal of oil and hazardous wastes produced by industry. Major topics include characteristics of hazardous materials, including methods for their transportation and storage. It also includes advanced aspects of risk assessment; applicable environmental legislation; waste characterizations, minimization and recovery; chemical, physical, and biological waste treatment methods; thermal, injection well and landfill disposal methods; and a section on the transportation of hazardous wastes.

**471. [371]. Education and Training Methods for Occupational Safety and Health.** Credit 3 hours. This course introduces the concepts of adult training and education with emphasis on occupational safety and health. Major topics include: instructional system design, including performing a training needs assessment tasks analysis, program design goals and objectives, performance evaluation, delivery methods and media; computer-based training methods; systems to manage costs; and record keeping.