



## 1. GENERAL INFORMATION

<b>COURSE</b>	:	Safety and Occupational Health Management in Construction
<b>CODE</b>	:	CI131
<b>SEMESTER</b>	:	201501
<b>INSTRUCTORS</b>	:	<b>Castro Ochoa, Ramiro Guillermo</b> <b>Palacios Lizier, Carlos</b> <b>Andrés</b>
<b>CREDITS</b>	:	3
<b>WEEKS</b>	:	15
<b>HOURS</b>	:	3 Hours (Theory) / Week
<b>TOTAL HOURS</b>	:	42
<b>AREA OR SCHOOL</b>	:	Civil Engineering

## 2. MISION AND VISION

Mission: To educate upstanding and innovative leaders with a global vision, who will transform Peru.

Vision: To be at the forefront in higher education for academic excellence and innovative capability.

## 3. INTRODUCTION

GLOBALIZATION has caused construction companies to develop comprehensive reforms in their traditional management systems and to establish internal policies aimed at improving their COMPETITIVENESS level, increasing the quality of their works and reducing the costs of their offers. Therefore, they need to increase their productivity through mechanisms that guarantee a considerable reduction of possible loss in the construction process.

Additionally, the enforcement of local regulations aimed at protecting the environment and guaranteeing the worker's safety and health has made construction companies include mechanisms minimizing the environmental impact and guaranteeing the effective control of actual risks in the working environment in their construction processes and procedures.

These new demands and the leading construction business' trend to manage labor risk prevention and environmental protection along the line of command have triggered the need to incorporate this specialization course, aimed at complementing the knowledge acquired in professional careers related to the construction sector, among them, civil engineering.

This course helps develop a solid culture of environmental and worker's safety and health respect in the student, supplementing it with tools that will allow him or her to exert an effective and efficient control of labor and environmental risks present in all construction processes, convincing the student of its close relationship with productivity and quality.

This course is divided into four units; each one of them contains the fundamentals to understand and apply labor and environmental risk prevention techniques during the construction works.

#### **4. COURSE OUTCOMES**

This course will enable the student to adequately use the management tools that will allow him or her to structure a Safety, Environment and Occupational Health plan suited to the project, complying with the local laws and regulations in force.

This course contributes to the following Program Outcomes:

Outcome k: "Ability to use techniques, skills, modern engineering tools, methodologies and processes necessary for the practice of Civil Engineering."

#### **5. LEARNING UNITS**

##### **UNIT No.1: RISK FACTOR IN CONSTRUCTION WORKS. CAUSES AND CONSEQUENCES. LOCAL REGULATORY FRAMEWORK FOR LABOR RISKS AND ENVIRONMENTAL MANAGEMENT IN THE CONSTRUCTION SECTOR.**

###### **LEARNING OUTCOME:**

This unit will enable the student to learn about the current safety and health situation in Peruvian construction works and the typical hazards of the construction activity. The student interprets and applies local technical standards and regulations on labor risks prevention and environmental management applicable to construction works.

###### **TOPICS LIST:**

Safety and health conditions in Peruvian construction works

Introduction to construction works hazards

Job accidents, causes and consequences

Local technical standards and regulations on labor risks prevention and environmental management applicable to construction works.

###### **HOURS / WEEKS**

Weeks 1 and 2

##### **UNIT No.2: OPERATING RISKS IN CONSTRUCTION WORKS**

###### **LEARNING OUTCOME:**

This unit will enable the student to clearly identify the most frequent risks construction workers face and determine the most effective and efficient way to protect himself against them.

###### **TOPICS LIST:**

Use of hand tools

Risks resulting from the use of hand tools and machines

Risks resulting from material use and manipulation

Risks resulting from the use of electricity

Safety in specific construction works

Risks in specific activities: demolitions, excavations, earth movement (heavy machinery), timbering and its removal, production/pouring concrete, modifications/use of steel, metallurgy work (electric and oxyacetylene welding, compressed gas cylinders), confined space work, mechanical hoisting

Industrial hygiene in construction works

Concepts Health hazards and preventive measures

Environmental management elements

Concepts. Environmental aspects in construction works. Handling waste, noise control, dust control

### **HOURS / WEEKS**

Weeks 3 and 4

### **UNIT No.3: INDIVIDUAL PROTECTION AND COLLECTIVE PROTECTION APPLICABLE IN CONSTRUCTION WORKS. SAFE WORK ANALYSIS**

#### **LEARNING OUTCOME:**

This unit will enable the student to choose the most effective personal and collective safety equipment, based on the risks in construction activities. The student understands safety sign schemes to properly place the following types of signs: prohibition, warning, obligation, rescue, in and outside the works, in relation to the current signaling standards applicable in construction works.

Additionally, the student will be able to prepare a work safety analysis, applying the concepts of danger, hazard and preventive measures in any activity within the works.

#### **TOPICS LIST:**

Personal Protective Equipment (PPE) and Collective Protection Systems (CPS). Technical specifications. Technical and economic evaluation. Selection of PPE/CPS  
Signaling. Local and international standards

Safe Work Analysis

Works visits to observe dangers, hazards, and control measures applied in the field

### **HOURS / WEEKS**

Weeks 5, 6 and 7

## UNIT No.4: SAFETY AND OCCUPATIONAL HEALTH PLAN

### LEARNING OUTCOME:

This unit will enable the student to design a Safety and Occupational Health Plan for a specific project according to the standard OHSAS 18001 and the current laws in the country.

### TOPICS LIST:

Safety and Occupational Health policy and objectives

Hazard identification and risk assessment, and operating control matrix

Hazard identification and risk assessment, risk assessment, operating control mechanisms

Roles and responsibilities, safety and health communications in works, internal audits, workforce training

Emergency response plans: design, implementation, tests (DRILLS) and adjustments

Registering non-conformity. Establishing corrective measures

Work accident investigation, determining causes (analysis methods), mitigation actions and correction actions

Work accident statistics. Performance indicators analysis, actions for continuous improvement

### HOURS / WEEKS

Weeks 9, 10, 11, 12, 13, 14, 15

## 6. TEACHING METHODS

This course uses an active methodology for the teaching-learning process, where students have an active participation in every class, both individually and in work groups. Instructors lecture and give examples to complement students' activities, with visual aids (PowerPoint presentations, videos) and the use of the whiteboard. The activities in the class are complemented with homework students do in groups and supplementary readings to be evaluated in quizzes and exams.

## 7. EVALUATION

### FORMULA

20% (PC1) + 30% (EA1) + 20% (PC2) + 30% (TF1)

GRADE BREAKDOWN	WEIGHT %
PC - TESTS PC	20
EA - MIDTERM EVALUATION	30
PC - TESTS PC	20
TF - FINAL ASSIGNMENT	30

## 8. SCHEDULE

EVALUATION	DESCRIPTION	NUMBER EVALUATION	DATE	COMMENTS	MAKE-UP TEST
PC	TESTS PC	1	Week 5		YES
EA	MIDTERM EVALUATION	1	Week 8		NO
PC	TESTS PC	2	Week 10		YES
TF	FINAL ASSIGNMENT	1	Week 15		NO

## 9. COURSE BIBLIOGRAPHY

### BASIC

AZCUÉNAGA LINAZA, Luís María (2004). Guía para la Implantación de un Sistema de Prevención de Riesgos Laborales.

ENRÍQUEZ PALOMINO, Antonio y SANCHEZ RIVERO, José Manuel (2006) La Norma OHSAS 18001 Utilidad y Aplicación Práctica.

[OIT](http://www.upc.edu.pe/) (2000) Seguridad y salud en los trabajos de construcción: CASO PERÚ 24 de julio de 2009 (<http://www.upc.edu.pe/>)

PÉREZ SÁNCHEZ, Luis Manuel (2000) Curso de Prevención de riesgos Laborales en la construcción, SANCHEZ RIVERO, José Manuel (2006). El coordinador de seguridad y salud

### RECOMMENDED

(Not necessarily available in the Information Center)

[AZCUÉNAGA LINAZA, Luís María](#) (2006) Manual práctico para la investigación de accidentes e incidentes laborales.. Fundación CONFEMETAL.

[BIRD, Frank E.; GERMAIN, George L.](#) (1990) Liderazgo Práctico en el Control de Pérdidas.. Internacional Loss Control Institute.

[CONSEJO INTERAMERICANO DE SEGURIDAD](#) (2009) Manual de Prevención de Accidentes en la Construcción.

[GRANERO CASTRO, Javier FERRANDO SANCHEZ, Miguel](#) (2005) Como Implantar un Sistema de Gestión Ambiental según la Norma ISO 14001:2004. Fundación CONFEMETAL.

[INSTITUTO NACIONAL DE SEGURIDAD Y SALUD EN EL TRABAJO](#) (1991) Manual para estudios y planes de seguridad e higiene en la construcción. 4a ed.

[MÍNGUES FERNÁNDEZ, César](#) (1998) Planificación y ejecución de la prevención, evaluación de riesgos en construcción.. Fundación Escuela de la Edificación.

[OIT](#) (1997) Seguridad y salud en los trabajos de construcción: Manual de Capacitación.

[REGULACIONES DE LA INDUSTRIA DE LA CONSTRUCCIÓN](#) (2005) OSHA 29 CFR 1926. Reglas Press.

[RIVERA RICO, José María](#) (2006) Auditorias de los Sistemas de Prevención de Riesgos Laborales. Fundación CONFEMETAL.

[SANCHEZ IGLESIAS, Angel Luis; GRAU RIOS, Mario](#) (1999) Nueva normativa de prevención de riesgos laborales: Aplicación práctica. 2a ed. FREMAP.

WORK RISK PREVENTION IN CONSTRUCTION WORKS

