UNIVERSITY OF CENTRAL ASIA

UCA STUDENT SYLLABUS

NARYN CAMPUS

COURSE TITLE: Safety Management

COURSE #: COMP4011

Timing: 90-minute classes

Number of weeks: 16 weeks

Course Faculty (and office number): Dmytro Zubov, office 3.18

Office hours: Monday to Friday 4 pm to 5 pm

Contact information: dmytro.zubov@ucentralasia.org, +996770822135

Prerequisites and/or Corequisites (if applicable): Students must have basic knowledge of computer systems, mathematical and algorithmic logics, understand major control structures such as branching, loops and expressions, be able to use functions and create arrays of elementary objects in C/C++/Python programs.

Last updated: January 12, 2023

Course Description. The course Safety Management introduces occupational safety and health principles and techniques. A systematic approach includes hazard identification, risk assessment, and procedures for controlling and monitoring them, and hence risks and hazards are identified at the earliest point possible. Students sort out major types of workplace health and safety risks, review existing standards, and learn how to conduct a workplace audit. They also find out how employers and unions might improve health and safety outcomes. Students are encouraged to design, implement, and evaluate small-scale safety management systems in teams of up to three people.

Course Learning Outcomes. Upon the successful completion of this course, students will be able to:

1. Design a safe workplace environment based on the Occupational Health and Safety standards and principles
2. Identify major electrical hazards and describe electrical protection methods against them
3. Find out common work-related musculoskeletal disorders and recognize risk factors associated with them
4. Handle emergency action and fire protection plans
5. Use proper personal protective equipment in accord with the hierarchy of controls
6. Recognize workplace situations involving machinery that requires guarding
7. Identify types of fall hazards at the workplace and eliminate them
8. Describe ways to identify workers who are at risk of exposure to air borne viruses and bloodborne pathogens and methods for controlling exposure to the viruses and pathogens. Identify types of hazardous materials and how exposures can occur. Describe methods for eliminating physical hazards of hazardous materials.

Course Organization

- Weekly, classes will take place according to the schedule provided by the registrar office: 90-minute lecture with a short quiz and 90-minute problem-solving session
- Readings (not graded) – Weekly lecture notes and/or book chapters from the textbook/ reference material will be available on Moodle

Core Literacies. Critical thinking, problem solving, teamwork.

Attendance Policy. The university views class attendance as your individual responsibility. You are expected to attend all classes, complete all assignments, and take all exams as scheduled. Instructors will take attendance every class. If you miss more than 10 % of class time, you may not be able to write the final exam or get credit for the course. Each absence from a class session or part of a class session must be justified in writing to the faculty member. If you are late for class, the instructor may mark you as absent. See UCA's Attendance Policy to understand all your rights and obligations.

Academic Integrity. You are reminded that plagiarism (representing another person's ideas, writings, etc., as one's own) is a serious academic offence; the penalty can be as severe as expulsion. Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see UCA's Academic Integrity Policy). All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents

in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between UCA and Turnitin.com. See UCA's Academic Integrity Policy to understand all your rights and obligations.

Required Resources/Textbook Readings:

- Lecture notes will be available on Moodle
- Occupational Safety and Health (OSH): European Agency for Safety and Health at Work. https://oshwiki.eu
- Occupational Safety and Health Administration: United States Department of Labor. https://www.osha.gov
- Charles D. Reese (2016). Occupational Health and Safety Management: A Practical Approach. 3rd Ed., CRC Press

Course Assessments and Grading. The final grade is computed according to the following weights:

Item	**Date Due**	**Weight**
Problem-solving sessions (14 sessions)	By the end of the current week	28
Homework assignments (1 assignment)	By the end of the current week	2
Quizzes (13 quizzes)	By the end of the current week	13
Course project (1 course project)	By the end of the 15th week	17
Midterm exam (1 midterm exam)	Midterm exam week	20
Final exam (1 final exam)	Final exam week	20
Total		**100%**

The midterm and final exams include two parts (quiz and practice) 50% each.

Course Calendar

Week #	**Topics**	**Homework, problem-solving session, and/or quiz**
01	**Introduction to Safety Management** • Introducing the syllabus, content of lectures, tutorials, and requirements • Identifying key terminology • Prevention as a key concept in Safety Management • Categories of safety signs • Discussion of the course project: topics and groups • Small group discussion and presentation: Prevention as a key concept in Safety Management • **Homework 01:** Course project proposals	Lecture notes and/or reference material are provided on Moodle. • **Quiz 01:** Safety Management
	Problem-solving session 01: Implement the safety and health program in your department/company (in the context of CS, CE, and SE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 01:** Implement the safety and health program in your

		department/company (in the context of CS, CE, and SE)
02	**International Standards and ISO 45001 – Occupational Health and Safety** • Intro to occupational safety and health international standards • International standards and ISO 45001 • A high-level structure and implementation of ISO 45001: scope, normative references, terms and definitions, context of the organization, leadership, planning for the management system, support, operation, performance evaluation, improvement • Small group discussion and presentation: Implementation of Occupational Health and Safety standard ISO 45001 • Project proposals' presentations	Lecture notes and/or reference material are provided on Moodle. • **Quiz 02:** ISO 45001
	Problem-solving session 02: International Standards and ISO 45001 (in the context of CS, CE, and SE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 02:** International Standards and ISO 45001 (in the context of CS, CE, and SE)
03	**COVID-19 and Bloodborne Pathogens** • COVID-19: Adapting workplaces and protecting workers • Define bloodborne pathogens • Identify workers who are at risk of exposure to bloodborne pathogens • Identify key aspects of a Bloodborne Pathogen Exposure Control Plan • Describe methods for controlling exposure to bloodborne pathogens • Describe steps to take when exposed to a bloodborne pathogen • Small group discussion and presentation: Health and safety matters for students embarking on work experience	Lecture notes and/or reference material are provided on Moodle. • **Quiz 03:** COVID-19 and Bloodborne Pathogens
	Problem-solving session 03: COVID-19 and Bloodborne Pathogens	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 03:** COVID-19 and Bloodborne Pathogens
04	**Electrical Hazards and Electrical Protection Methods** • Electrical hazards • Electrical protection methods • Employer requirements to protect workers from electrical hazards	Lecture notes and/or reference material are provided on Moodle. • **Quiz 04:** Electrical Hazards and Electrical Protection Methods

	• Small group discussion and presentation: Electrical hazards and electrical protection methods	
	Problem-solving session 04: Electrical Hazards and Electrical Protection Methods (in the context of CS, CE, and SE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 04:** Electrical Hazards and Electrical Protection Methods (in the context of CS, CE, and SE)
05	**Electrical Safety-Related Work Practices** • Accident prevention • The role of electrical safety in Computer Engineering • Basic concepts and techniques of electrical safety-related work practices. • Electrical safety training as a key safety practice for personnel who may come into contact with electrical hazards • Small group discussion and presentation: Health and safety matters for students embarking on work experience	Lecture notes and/or reference material are provided on Moodle. • **Quiz 05:** Electrical Safety-Related Work Practices
	Problem-solving session 05: Electrical Safety-Related Work Practices (in the context of CS, CE, and SE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 05:** Electrical Safety-Related Work Practices (in the context of CS, CE, and SE)
06	**Health and Safety in the Laboratory** • Health and safety hazards of school laboratory work • Health and safety measures that the laboratory should have in place • Protect students/workers from hazardous exposures • The requirements of OSHA's Laboratory Standard • Small group discussion and presentation: Control of hazardous energy	Lecture notes and/or reference material are provided on Moodle. • **Quiz 06:** Health and Safety in the Laboratory
	Problem-solving session 06: Health and Safety in the Laboratory (in the context of CS, CE, and SE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 06:** Health and Safety in the Laboratory (in the context of CS, CE, and SE)
07	**Introduction to Ergonomics** • Common work-related musculoskeletal disorders (MSDs). • Risk factors associated with work-related MSDs. • Ergonomic control methods for eliminating work-related MSDs • Presentation of the semester project's intermediate results	Lecture notes and/or reference material are provided on Moodle. • **Quiz 07:** Ergonomics

	• Preparation for the midterm exam • Small group discussion and presentation: Computer ergonomics	
	Problem-solving session 07: Introduction to Ergonomics (in the context of CS, CE, and SE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 07:** Introduction to Ergonomics (in the context of CS, CE, and SE)
08	**Midterm exam**	
09		
10	**Exit Routes, Emergency Action Plans, Fire Prevention Plans, and Fire Protection** • Emergency Action plan • Fire Protection plan • Conditions under which evacuation actions may be necessary in an emergency situation • Conditions under which shelter-in-place may be necessary in an emergency situation • Characteristics of an effective emergency escape route • Five types of fire extinguishers, including the types of fires they can extinguish • Requirements for proper maintenance of portable fire extinguishers • Small group discussion and presentation: Exit Routes, Emergency Action Plans, Fire Prevention Plans, and Fire Protection	Lecture notes and/or reference material are provided on Moodle. • **Quiz 08:** Exit Routes, Emergency Action Plans, Fire Prevention Plans, and Fire Protection
	Problem-solving session 08: Exit Routes, Emergency Action Plans, Fire Prevention Plans, and Fire Protection	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 08:** Exit Routes, Emergency Action Plans, Fire Prevention Plans, and Fire Protection
11	**Personal Protective Equipment and Machine Guarding** • Description of the controls' hierarchy and the personal protective equipment • Types of the personal protective equipment the in general industry • Personal protective equipment training requirements • Employer responsibilities regarding personal protective equipment • Main causes of machinery accidents • Basic machinery parts that expose workers to hazards • Workplace situations involving machinery that requires guarding • Requirements for machine safeguards • Small group discussion and presentation: Personal Protective Equipment and Machine Guarding	Lecture notes and/or reference material are provided on Moodle. • **Quiz 09:** Personal Protective Equipment and Machine Guarding

	Problem-solving session 09: Personal Protective Equipment and Machine Guarding (in the context of EE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 09:** Personal Protective Equipment and Machine Guarding (in the context of EE)
12	**Fall Protection** • Identify types of fall hazards associated with workplace environments. • Identify methods to eliminate or protect against fall hazards • Fall protection in construction • Small group discussion and presentation: Fall Protection	Lecture notes and/or reference material are provided on Moodle. • **Quiz 10:** Fall Protection
	Problem-solving session 10: Fall Protection (in the context of EE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 10:** Fall Protection (in the context of EE)
13	**Hazard Communications and Hazardous Materials** • The employer's responsibilities under the hazard communication safety, including training requirements • Components of a Hazard Communication program • Requirements of the different types of Hazard Communication labels • Types of hazardous materials and how exposures can occur • Hazards associated with hazardous materials, including injuries that may occur • Methods for eliminating physical hazards of hazardous materials • Small group discussion and presentation: Hazard Communications and Hazardous Materials	Lecture notes and/or reference material are provided on Moodle. • **Quiz 11:** Hazard Communications and Hazardous Materials
	Problem-solving session 11: Hazard Communications and Hazardous Materials (in the context of EE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 11:** Hazard Communications and Hazardous Materials (in the context of EE)
14	**Introduction to Industrial Hygiene** • Types of health hazards in the workplace • Strategies to control chemical hazards • Strategies to control biological hazards • Strategies to control physical hazards • Strategies to control ergonomic hazards • Small group discussion and presentation: Industrial Hygiene	Lecture notes and/or reference material are provided on Moodle. • **Quiz 12:** Industrial Hygiene

	Problem-solving session 12: Introduction to Industrial Hygiene (in the context of EE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 12:** Introduction to Industrial Hygiene (in the context of EE)
15	**Materials Handling, Storage, and Disposal** • Types of material handling equipment • Hazards associated with material handling activities • Methods to prevent hazards associated with material handling equipment • Employer requirements to protect workers from material handling hazards • Small group discussion and presentation: Materials Handling, Storage, and Disposal	Lecture notes and/or reference material are provided on Moodle. • **Quiz 13:** 1. Materials Handling, Storage, and Disposal 2. Walking and Working Surfaces, including Fall Protection
	Walking and Working Surfaces, including Fall Protection (optional) • Hazards in the workplace associated with walking and working surfaces • Best practices for eliminating or controlling hazards associated with walking and working surfaces in the workplace • Employer requirements to protect workers from walking and working surface hazards • Small group discussion and presentation: Walking and Working Surfaces, including Fall Protection	
	Problem-solving session 13: Materials Handling, Storage, and Disposal (in the context of EE)	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 13:** Materials Handling, Storage, and Disposal (in the context of EE)
16	**Revision (summary of the course and acquired knowledge, Q&A session), Project Discussions, Viva**	Lecture notes and/or reference material are provided on Moodle. Revision, Project Discussion, Viva
	Problem-solving session 14: Preparation for the final exam	Lecture notes and/or reference material are provided on Moodle. **Problem-solving session 14:** Preparation for the final exam
17	**Final exam**	

The weekly schedule is subject to change as the course progresses.