

HEALTH AND SAFETY AT WORK I

MSc Degree in Integrated Management Systems QAS (Quality, Environment and Safety)

Code: 9090110

Main Scientific Area: Health, Environment and Industrial Technologies

Lecturer: Filipe José da Fonseca Carvalho

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 44h Total Workload: 176h

ECTS: 8,0

Objectives

Provide to students knowledge about hygiene at work and ergonomics: Identify occupational risks (physical, biological, chemical and ergonomic risks) in terms of prevention and protection; Understand and apply legal and regulatory requirements, as well as preventive and protective criteria to reduce occupational risks (physical risks, biological risks, chemical risks and ergonomic risks). Understand the importance of prioritizing prevention measures through the application of different occupational health and safety techniques in the approach to occupational risks (physical risks, biological risks, chemical risks and ergonomic risks).

Learning Outcomes

Identify and understand the principles and domains of the hygiene at work. Characterize the occupational diseases. Understand the notions of toxicology and industrial ventilation. Identify and understand the applicable legal and regulatory framework. Identify, understand and reduce the consequences of the physical risks (noise, vibration, radiation ionizing and non-ionizing, thermal environment and lighting), biological risks and chemical risks. Identify simplified chemical risk assessment methodologies. Interpret and apply the principles and domains of ergonomics. Understand the notions of anthropometry and biomechanics. Identify and understand methods for workplace ergonomic risk assessment/analysis (EWA FIOH Guide). Identify and understand methods for risk assessment of work-related musculoskeletal injuries (NIOSH equation, REBA method and RULA method).

Course Contents

Chapter 1

1. Hygiene at work

1.1. Principles and domains of hygiene at work

1.2. Characterization of occupational diseases

1.3. Notions of toxicology and industrial ventilation

1.4. Legal and regulatory framework

1.5. Physical risks/agents: Noise, vibration, radiation (ionizing and non-ionizing), thermal environment and lighting

1.6. Biological risks/agents

1.7. Chemicals risks/agents

1.8. Chemical risk assessment simplified methodologies

Chapter 2

2. Ergonomics

2.1. Interpret and apply the principles and domains of ergonomics

2.2. Notions of anthropometry and biomechanics

2.3. Workplace ergonomic risk assessment/analysis: EWA FIOH guide 2.4. Methods for risk assessment of Work-Related Musculoskeletal Injuries (WRMI): NIOSH equation, REBA method and RULA method

Recommended Bibliography

Alli, B. O. (2008). Fundamental principles of occupational health and safety (2nd Edition). Geneva, Switzerland: International Labour Office. ISBN: 978-92-2-120454-1

Brauner, R. L. (2016). Safety and health for engineers (3rd Edition). Hoboken, NJ: Wiley-Interscience. ISBN: 978-1119-219187

Cabral, F. (2011). Segurança e saúde do trabalho: Manual de prevenção de riscos profissionais (1.ª Edição). Lisboa: Verlag Dashöfer. ISBN: 978-989-642-137-3

Elgstrand, K., Petersson, N. F. (2009). Occupational safety and health for development (1st Edition). Stockholm, Sweden: Elanders Sverige AB. ISBN: 978-91-633-4798-6

Finacure, E. W. (2006). Definitions, conversions, and calculations for occupational safety and health professionals (3rd Edition). Boca Raton, FL: CRC Press. ISBN: 978-1-56670-640-7

Freitas, L. C. (2022). Manual de segurança e saúde do trabalho (5.ª Edição). Lisboa: Edições Sílabo. ISBN: 978-989-561-205-5

Friend, M. A., Kohn, J. P. (2007). Fundamentals of occupational safety and health (4th Edition). Lanham, Maryland: Government Institutes. ISBN: 978-0-86587-171-7

Fuller, T. P. (2019). Global occupational safety and health management handbook (1st Edition). Boca Raton, FL: CRC Press. ISBN: 978-1-138-62672-0

Grandjean, E. (1998). Manual de ergonomia: Adaptando o trabalho ao homem (4.ª Edição). Porto Alegre: Bookman. ISBN: 978-857-3073539

Helander, M. (2006). A guide to human factors and ergonomics (2nd Edition). Boca Raton, FL: CRC Press. ISBN: 978-0-415-28248-2

Hughes, P., Ferret, E. (2016). Introduction to health and safety at work: For the NEBOSH national general certificate in occupational health and safety (6th edition). New York, NY: Routledge. ISBN: 978-1-315-85789-3

Karwowski, W., Marras, W. S. (2003). Occupational ergonomics: Design and management of work systems (1st

Edition). Boca Raton, FL: CRC Press. ISBN: 978-0-8493-1801-7

Koradecka, D. (2010). Handbook of occupational safety and health (1st Edition). Boca Raton, FL: CRC Press. ISBN: 978-1-4398-0685-2

Letho, M. R., Buck, J. R. (2008). Introduction to human factors and ergonomics for engineers (1st Edition). New York, NY: Taylor Francis Group. ISBN: 978-0-8058-5308-7

Letho, M., Landry, S. J. (2008). Introduction to human factors and ergonomics for engineers (2nd Edition). Boca Raton, FL: CRC Press. ISBN: 978-1-4665-8416-7

Macedo, R. (2004). Manual de higiene do trabalho na indústria (3.^a Edição). Lisboa: Fundação Calouste Gulbenkian. ISBN: 978-972-3-10222-2

Marras, W. S., Karwowski, W. (2006). The occupational ergonomics handbook: Fundamentals and assessment tools for occupational ergonomics (2nd Edition). Boca Raton, FL: CRC Press. ISBN: 978-0-8493-1937-2

Miguel, A. S. S. R. (2014). Manual de higiene e segurança do trabalho (13.^a Edição). Porto: Porto Editora. ISBN: 978-972-0-01896-0

Nunes, F. M. D. O. (2010). Segurança e higiene do trabalho: Manual técnico (2.^a Edição). Amadora: Texto Editores. ISBN: 978-972-8-32645-6

Ridley, J., Channing, J. (2008). Safety at work (7th Edition). Burlington, MA: Elsevier. ISBN: 978-0-7506-8035-6

Sacadura-Leite, E., Sousa-Uva, A. (2018). Manual de saúde ocupacional em hospitais (1.^a Edição). Lisboa: Diário de Bordo Editores. ISBN: 978-989-99884-6-0

Salvendy, G. (2012). Handbook of human factors and ergonomics (4th Edition). Hoboken, NJ: John Wiley. ISBN: 978-1-118-12906-7

Smedley, J., Dick, F., Sadhra, S. (2013). Oxford handbook of occupational health (2nd Edition). Oxford, United Kingdom: Oxford University Press. ISBN: 978-0-19-965162-7

Sousa-Uva, A., Serranheira, F. (2019). Saúde, doença e trabalho: Ganhar ou perder a vida a trabalhar? (2.^a Edição). Lisboa: Diário de Bordo Editores. ISBN: 978-989-99884-9-1

Stanton, N., Hedge, A., Brookhuis, K., Salas, E., Hendrick, H. (2005). The handbook of human factors and ergonomics methods (1st Edition). Boca Raton, FL: CRC Press. ISBN: 0-415-28700-6

Stranks, J. (2002). Health and safety at work: Key terms (1st Edition). Woburn, MA: Butterworth-Heinemann. ISBN: 978-0-7506-5446-5

Stranks, J. (2006a). The A-Z of health and safety (1st Edition). London, United Kingdom: Thorogood Publishing. ISBN: 978-1-85418-387-7

Stranks, J. (2006b). The health safety handbook (1st Edition). London, United Kingdom: Kogan Page Limited. ISBN: 978-0-7494-4392-8
Stranks, J. (2008). Health safety at work: An essential guide for managers (Revised 8th Edition). London, United Kingdom: Kogan Page Limited. ISBN: 978-0-7494-5148-6

Learning and Teaching Methods

The syllabus of the curricular unit is in complete harmony with the objectives of the curricular unit. In other words, the various objectives of the curricular unit are fully aligned with the syllabus established for the curricular unit. Thus, the various objectives defined are fully based on the syllabus proposed for the curricular unit (see objectives and chapters 1 and 2):

1) The objectives related to hygiene at work are based on the syllabus of chapter 1; 2) The objectives related to ergonomics are based on the syllabus of chapter 2.

Assessment Methods

Continuous and Periodic Assessment

The final assessment of the Curricular Unit (CU) is supported by three (3) assessment elements: the participation in classes (accounts for 10% of the classification of the curricular unit); a group work – report (accounts for 40% of the classification of the curricular unit); and an individual written proof – test (accounts for 50% of the classification of the unit curricular). Thus, the final classification of the curricular unit is calculated by the following mathematical equation:

$$FC = (CPC \times 0.10) + (GWRC \times 0.40) + (IWPC \times 0.50)$$

Where:

FC – Final Classification

CPC – Classes Participation Classification

GWRC – Group Work Report Classification

IWPC – Individual Written Proof Classification (Test)

Assessment by Final Exam

The final assessment of the Curricular Unit (CU) is supported by one (1) assessment element: an individual written proof – exam (accounts for 100% of the classification of the unit curricular). Thus, the final classification of the curricular unit is calculated by the following mathematical equation:

$$FC = IWPC$$

Where:

FC – Final Classification

IWPC – Individual Written Proof Classification (Exam)

NOTE: In the assessment of the curricular unit, all classifications are assigned on a scale of zero (0) to twenty (20) values. Thus, the student obtains approval to the curricular unit when the final classification of learning is at least 10 values.

