

Ficha de Unidade Curricular (FUC)

Curso:	MESTRADO EM ENGENHARIA E GESTÃO INDUSTRIAL					
Unidade Curricular	Organizational Systems Management				Obrigatória	
					Opcional	X
Área Científica:	Industrial Engineering and Management					
Ano: 1º	Semestre: 2º	ECTS: 5		Total de Horas: 135		
Horas de Contacto:	T:	TP: 45	PL:	S:	OT:	TT:
Professor Responsável		Grau/Título		Categoria		
Vitor Manuel Rodrigues Anes		Doutor		Professor Adjunto		

T- Teórica ; TP – Teórico-prática ; PL – Prática Laboratorial ; S – Seminário ; OT – Orientação Tutorial ; TT – Total de horas de Contacto

Entrada em Vigor	Semestre: Verão	Ano Letivo: 2020/2021
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Objectivos da unidade curricular e competências a desenvolver (max. 1000 caracteres)

It is intended that at the end of this course students reveal the following skills and abilities:

- Understand the complexity of organizational systems from a holistic point of view to forecast and analyse long-term decisions.
- Understand the importance of holistic approaches and understand the relationship between the whole and the parts.
- Understand the importance of sustainable solutions with lasting value for organizations and society.
- Build simulation models of complex systems to understand their evolution over time.
- Realize that the organization's success is related to strategy, its internal structure and relationship with customers, competitors, suppliers, and other parties.

Conteúdos programáticos (max. 1000 caracteres)

1- Introduction to Systemic Thinking

- 1.1– The organizational context.
- 1.2 - Basic concepts of systems theory.
- 1.3 - Properties of complex systems.
- 1.4 - Properties of organizational systems.
- 1.5 - Systemic approach in the management of organizations.

2- Construction of dynamic models

- 2.1 - Introduction.
- 2.2 - Construction of mind maps.
- 2.3 - Causal Diagrams. Application cases.
- 2.4 - Concept of delay. Application cases.
- 2.5 - Archetypes.
- 2.6 - Concept of Resource status - levels and operation. Application cases.
- 2.7 - Behaviour of dynamic systems.
- 2.8 - Organizational diagnosis.
- 2.9 - Exercises.

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3- Simulation

- 3.1 – Introduction to simulation and simulation software.
- 3.2 – Steps to implement simulation models.
- 3.3 – Types of variables.
- 3.4 – Types of functions.
- 3.5 – Results analysis of simulation models.
- 3.6 – Criteria for scenarios construction.
- 3.7 – Evolution of systems.
- 3.8 – Exercises.

4- Case studies

- 4.1 – Application of dynamic systems in logistics.
- 4.2 – Application of dynamic systems in production.
- 4.3 – Application of dynamic systems in innovation processes.
- 4.4 – Application of dynamic systems in organizations.

Demonstração da coerência dos conteúdos programáticos com os objetivos da unidade curricular (max. 1000 caracteres)

The syllabus chapters correspond to the fundamental concepts to be acquired by the student as referred in the course objectives.

Metodologias de ensino (avaliação incluída) (max. 1000 caracteres)

Whenever applicable, the teaching methodology includes classes with oral presentation, presentation of case studies, problem solving activities and use of computer applications in the laboratory.

Assessment: Mandatory Assignment (50%) + Final Exam (50%). In each of these two assessments the minimum classification is 10 points (scale 0 to 20 points).

Demonstração da coerência das metodologias de ensino com os objetivos da unidade curricular (max. 3000 caracteres)

The teaching methodology includes a theoretical and practical teaching component. In the theoretical classes, the principles and concepts that will allow the student to understand the topics covered in this course are discussed.

The theoretical component is complemented with a practical part in which students will solve exercises and discuss case studies that will allow them to consolidate theoretical concepts.

The practical work of the discipline seeks that students test and demonstrate the acquisition of technical knowledge and the acquisition of skills in problem solving, teamwork, critical thinking, and communication.

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Bibliografia Principal (max. 1000 caracteres)

- García, J. M. (2020). *Theory and Practical Exercises of System Dynamics: Modeling and Simulation with Vensim PLE*. Preface John Sterman. Juan Martin Garcia.
- Haines, S. (2016). *The systems thinking approach to strategic planning and management*. CRC Press.
- Gharajedaghi, J. (2011). *Systems thinking: Managing chaos and complexity: A platform for designing business architecture*. Elsevier.
- McGarvey, B., & Hannon, B. (2004). *Dynamic modeling for business management: An introduction*. Springer Science & Business Media.
- Sterman, J. (2010). *Business dynamics*. Irwin/McGraw-Hill