



1. GENERAL INFORMATION				
1.1. Course teacher	Assist. Prof. Marijo Buzuk, PhD Assist. Prof. Maša Buljac, PhD		1.6. Year of the study	1 <sup>st</sup> year (2 <sup>nd</sup> semester)
1.2. Name of the course	Environmental Management Tools		1.7. ECTS credits	5
1.3. Associate teachers			1.8. Type of instruction (number of hours L + E + S + e-learning)	Total: 60 (L:30,E:0,S:30)
1.4. Study programme (undergraduate, graduate, integrated)	graduate		1.9. Expected enrolment in the course	20
1.5. Status of the course	<input checked="" type="checkbox"/> mandatory	<input type="checkbox"/> elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	2
2. COUSE DESCRIPTION				
2.1. Course objectives	The main objective of this course is an introducing student to the steps and processes during the implementation of the ISO 14001 standard in business subjects and in possible problems that arising from the implementation process and to resolve issue. Furthermore, one of the goals of this course is to introduce students to the development and future trends in the development of international norms that it is needed for understanding and applying them in various systems.			
2.2. Enrolment requirements and/or entry competences required for the course				
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> <li>• Correlate expert knowledge from chemistry, chemical engineering and material engineering with awareness of influence on society, economy and environment.</li> <li>• Optimise complete and sustainable technological processes using analysis and modelling aimed at waste minimization utilising the strategy of the closed cycle manufacturing.</li> <li>• Apply tools, methods and standards for monitoring and assessing the quality of processes and products, as well as their environmental impact, and to predict potential risks in working with technological processes and developing products.</li> <li>• Demonstrate independence and reliability in independent work, as well as effectiveness, reliability and adaptability in team work</li> </ul> Communicate with the scientific and professional community, as well as society in general in local and international surroundings			
2.4. Expected learning outcomes at the level of the course (3 to 10 learning outcomes)	<ul style="list-style-type: none"> <li>• Explain the concept of integrated environmental engineering, sustainable development, and will have ability to measure and proceed for the protection of the environment.</li> <li>• Apply procedures for integral area planning, according to principles of sustainable development and estimate environmental impact (either Strategic Impact Assessment or any estimation of the environmental impact).</li> <li>• Estimate and manage risk, as well as its quantitative and qualitative representation.</li> </ul>			



	<ul style="list-style-type: none"> <li>• Planning procedures for environmental management, related to the environmental impact study, and the Committee for Strategic Studies and Environmental Strategy.</li> <li>• Based on the the Regulations on Environmental Impact Estimation and the steps in the preparation of studies, apply acquired knowledge in implementation of various Estimation and Environmental Programmes.</li> <li>• Determine the most applicable technique for a specific activity according to the European guidelines. Identify and resolve nonconformities that occur during this process.</li> <li>• Apply acquired knowledge in organisations that have implemented the Environmental Management System ISO 14001, related to its maintenance and improvement.</li> <li>• Use knowledge that will enable them to implement and manage the establishment of the ISO 14001 standard in various subjects.</li> <li>• Apply acquired knowledge in implementation, maintenance and development of EMS, within the ISO 9001 standard.</li> </ul>
2.5. Course content (syllabus)	<p><b>WEEK 1.</b> The definition of technology; similarities and differences; historical development of the term. Impacts and Challenges of technology. The separations technology.</p> <p><b>WEEK 2.</b> Definition ecosystem, classification. Environment Protecting the environment. Pollution and contamination. Legal provisions in the RH.</p> <p><b>WEEK 3.</b> Sustainable Development; concepts, vision, future. Sustainable development laws of thermodynamics. The path towards sustainable development.</p> <p><b>WEEK 4.</b> Types of Environmental Engineering. Integrated approach. The measures and procedures to protect the environment. The political and sociological approach, legal measures.</p> <p><b>WEEK 5.</b> Planning and management of the area. Basic documents of Environmental Engineering. The environmental impact assessment. Risk management. Cost-benefit analysis. Seminar 1: Consideration and discussion of objectives and approach strategies, programs, studies on the process of planning and environment management.</p> <p><b>WEEK 6.</b> A study of the environmental impact - steps in the preparation. Legal provisions. Seminar 2: Consideration and discussion of goals and approach to the study of the environmental impact. The debate about the roles of various professionals, overlapping powers and competencies, and suggestions dismissal of the non-compliance! The interest of the community vs. capital interest.</p> <p><b>WEEK 7.</b> Methodology of the best available techniques. Seminar 3: A critical review of the methodology for the assessment of best available techniques - debates, discussions, debates, proposals. Development of algorithms and schemes for assessing best available techniques. Seminar 4: Evaluating and choosing the best available techniques for different procedures with the help of the guidelines. Landfills, waste gases, waste incinerators, cement industry, etc.</p> <p><b>WEEK 8.</b> Partial exam</p> <p><b>WEEK 9.</b> Systems - definition. Standards and Standardization. Croatian Standards Institute. Accreditation and certification. Types of norms.ISO. ISO 14001 Environmental Policy. Plan. Seminar 5: Development of ISO 14001 on examples of different organizations. Environmental policy. Plan.</p>



	<p><b>WEEK 10.</b> ISO 14001 Implementation and operational phases. Testing and verification. Seminar 6: Development of ISO 14001 on examples of different organizations. Implementation and operational phases. Testing and verification.</p> <p><b>WEEK 11.</b> The definition of quality. Family 9001 standard procedure of introducing a system of quality.</p> <p><b>WEEK 12.</b> General requirements of quality management systems and requirements relating to documentation.</p> <p><b>WEEK 13.</b> ISO 9001 Document Control and inspection records. Management responsibility and quality policy.</p> <p><b>WEEK 14.</b> Planning Quality Management System. Resource management. Control and improve the system. Self-evaluation. Integration of standards 14001 and 9001 in a joint management system. Similarities and differences.</p> <p><b>WEEK 15.</b> Partial exam. Seminar 7: Integration of standards 14001 and 9001 in a joint management system for the various economic operators.</p>								
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> online in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work			<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)			2.7. Comments:		
2.8. Student responsibilities									
2.9. Monitoring student work	Class attendance	YES		Research		NO	Oral exam	YES	
	Experimental work		NO	Report		NO	(other)		NO
	Essay		NO	Seminar paper	YES		(other)		NO
	Preliminary exam		NO	Practical work		NO	(other)		NO
	Project		NO	Written exam	YES		ECTS credits (total)	5	
2.10. Required literature (available in the library and/or via other media)	<b>Title</b>						<b>Number of copies in the library</b>	<b>Availability via other media</b>	
	S. Tinsley, I. Pillai, Environmental Management Systems, Earthscan, London, 2006.						2	x	
	D. Hunt, C. Johnson, Environmental Management Systems: Principles and Practice, McGraw-Hill Book Co Ltd, 1996.						1	x	
2.11. Optional literature									
2.12. Other (as the proposer wishes to add)									