COURSE SYLLABUS

Professional graduate study programme with master thesis						
Oznaka kolegija	**ISVU oznaka**	**Predmet**	**Predmet ENG**	**Nastavnik**	**Semestar**	**ECTS**
RSPZOP16 SZ806	165910, 83319	UPRAVLJANJE ZAŠTITOM OD POŽARA PRIMJENOM RAČUNALA	Computer Aided Fire Protection Management	Kralj, Damir	II.	6,0
SR303 SZ901	171332, 83286	UPRAVLJANJE ZAŠTITOM NA RADU PRIMJENOM RAČUNALA	Computer - Based Management in Occupational Safety	Kralj, Damir	III.	7,0
SR214 SZ807	165911, 83320	METODE ISTRAŽIVANJA POŽARA	Fire investigation methods	Jakšić, Lidija	II.	7,0
SZ912	171402 83322	EKSPERTIZA POŽARA I EKSPLOZIJA	Expertise of Fire and Explosion	Jakšić, Lidija	III.	6,0
SZ701	171404 171333, 38465	KONTROLA KVALITETE	Quality Control	Jakšić, Lidija	III.	6,0

VELEUČILIŠTE U KARLOVCU
Karlovac University of Applied Sciences

COURSE SYLLABUS

General information

Course title:	Computer - Based Management in Occupational Safety
ISVU course code:	171332
Course instructor:	Damir Kralj, PhD, college professor
Course assistant:	-
Study programme and specialization in which the course is taught:	Specialist graduate professional study of Safety and Protection Engineering - Protection at Work (full-time study)
ECTS credits:	7
Semester of the course execution:	III
Exam prerequisites:	-
Course objectives:	The aim of the course is to acquaint students with the basic methods and procedures of introducing and/or expanding computer-supported information systems with a special emphasis on proactive action within their future work environment. Therefore, to train students to be able to understand, carry out and improve the process of digital transformation, both in the field of security and protection, as well as in all other areas of human activities. Students will get acquainted with some of the versions of program support available on the market for keeping records of occupational safety, environmental protection and fire protection.

Course structure

Teaching mode	Number of contact hours per semester:	Student's requirements per teaching mode
Lectures:	30	presence of min. 80%
Exercises (auditory, linguistics):	45	presence of min. 80%
Exercises (laboratory, practical):		
Field work:		
Other:		
TOTAL:	75	

Monitoring of students' work and knowledge evaluation during the course

OUTCOMES		Colloquium	Seminary work and presentation	Final exam (or preliminary exam)	Total	Pass	Time frame for the recognition of the outcome
Outcome 1	Explain the main reasons and goals for the introduction of computer-supported information systems in business			8%	8%	4%	Until the end of ac. year
Outcome 2	Present the basic methods			8%	8%	4%	Until the end of ac.

	of analysis and design of information systems						year
Outcome 3	Classify possible factors of risk and failure when introducing new information systems			8%	8%	4%	Until the end of ac. year
Outcome 4	Differentiate and independently apply the basic methods and tools of process and data modeling	30%			30%	15%	Until the end of ac. year
Outcome 5	Assess the types of harmful effects and ways of their prevention			8%	8%	4%	Until the end of ac. year
Outcome 6	Illustrate the methods of selecting software, computer and network support of the information system			8%	8%	4%	Until the end of ac. year
Outcome 7	Independently analyze and evaluate the quality and security of modern information and communication solutions		30%		30%	15%	Until the end of ac. year
Total % grade points		30	30	40	100	50	
Share in ECTS		2,1	2,1	2,8			

Knowledge evaluation on exams

Exam prerequisites					
OUTCOMES		**Written exam**	**Oral exam**	**Total**	**Pass**
Outcome 1	Explain the main reasons and goals for the introduction of computer-	4%	4%	8%	4%

	supported information systems in business				
Outcome 2	Present the basic methods of analysis and design of information systems	4%	4%	8%	4%
Outcome 3	Classify possible factors of risk and failure when introducing new information systems	4%	4%	8%	4%
Outcome 4	Differentiate and independently apply the basic methods and tools of process and data modeling	30%		30%	15%
Outcome 5	Assess the types of harmful effects and ways of their prevention	4%	4%	8%	4%
Outcome 6	Illustrate the methods of selecting software, computer and network support of the information system	4%	4%	8%	4%
Outcome 7	Independently analyze and evaluate the quality and security of modern information and communication solutions	20%	10%	30%	15%
Total % of grade points		70%	30%	100%	50%
Share in ECTS		3,5	1,5	5	

Review of units per week with associated learning outcomes

Week	Lecture course content and learning outcomes:	Outcome	Exercises course content and learning outcomes:	Outcome
1.	Introduction to the course, definitions of basic terms	I1	Acquaintance with the equipment in the IT cabinet and the rules of conduct during exercises, analysis of the content of the exercises, the basics of using the available computer and software support	I1, I4
2.	Analysis of the relationship between the existing business (PS) and the planned information system (IS)	I1	Microsoft Excel: creation of simple records, data formatting, sorting and searching of workbook tables	I1, I4
3.	Basic principles, methods and techniques of IS planning and design	I2	Microsoft Excel: automation of data entry, standardized data exchange with other software tools and databases	I2, I4
4.	Comparison of the most frequently used methodologies for IS planning and design	I2	Microsoft Visio: display of the working environment, familiarization with templates, design of the working area (pages)	I2, I4
5.	Roles and tasks of participants in the planning and design process of IS	I2	Microsoft Visio: creation of organizational charts	I2, I4
6.	Analysis of possible risk factors and failures when introducing new IS	I3	Microsoft Visio: creation of E-V diagrams	I2, I4
7.	Basics of modeling procedures and data. Comparison of entities and objects	I4	Microsoft Access: view of the working environment, organization and overview of development tools	I2, I4
8.	Formatting the entity-relationship diagram. Application of MS Visio tools	I4	Microsoft Access: formatting data tables (intension, extension)	I4
9.	Analysis of the most common entity types within an IS. Attributes and their domains	I4	Microsoft Access: data import from other tools, normalization of table records imported from MS Excel	I4

10.	Basics of databases (relational, object, XML). Application of MS Access tools	I4	Microsoft Access: relational links and referential integrity	I4
11.	Methods of normalization of relational databases	I4	Microsoft Access: designing screen forms for entering, viewing and deleting data	I4
12.	Selection of software, computer and network support of the information system	I6	Microsoft Access: formatting various types of SQL queries and reports	I4
13.	Information system protection against data loss and harmful external influences	I5	Workshop: Lecture and analysis of a specific program solution for OS/FP management	I7
14.	Specifics of the information subsystems for the management of OS, EP and FP within the information system of a company. Analysis of strategic and tactical elements	I2, I4, I6, I7	Training in independent creation of tasks	I4
15.	An overview of the possibilities of some versions of software support available on the market for keeping OS, EP and FP records	I7	Colloquium	

References (compulsory / additional)

Compulsory:

1. Kralj, D., Informacijski sustavi u sigurnosti i zaštiti Udžbenik za studente stručnog diplomskog studija Sigurnosti i zaštite, Veleučilište u Karlovcu, Karlovac, 2024.
2. Kralj. D., Primjena računala, Veleučilište u Karlovcu, Karlovac, 2018.
3. Strahonja, V., Varga, M., Pavlić, M., Projektiranje informacijskih sustava – Metodološki priručnik, Zavod za informatičku djelatnost Hrvatske i INA - INFO, Zagreb, 1992.
4. ITdesk.Info, Microsoft Office 2010, ODRAZI, Zagreb, 2011.
5. ITdesk.Info, Računalna sigurnost, CARNET, Zagreb, 2011.

Additional:

1. Ross, CW, Computer Systems for Occupational Safety and Health Management – 2nd ed.,Marcel Dekker Inc., NewYork, 1991.
2. Fertalj, K., Kalpić, D., Projektiranje informacijskih sustava,Sveučilište u Zagrebu, FER – ZPR, 2006.
3. Luić, Lj., Informacijski sustavi Veleučilište u Karlovcu, Karlovac, 2009.
4. EVIZ, www.zitel.hr, ZITEL, Zagreb
5. WebZNR, www.linijakoda.hr, Zagreb
6. EVIDENKO, www.zirs.hr, Zavod za istraživanje i razvoj sigurnosti, Zagreb
7. Sinarm, www.sinarm.net, Web IT, Osijek

VELEUČILIŠTE U KARLOVCU
Karlovac University of Applied Sciences

COURSE SYLLABUS

General information

Course title:	Computer - Based Management in Occupational Safety
ISVU course code:	83286
Course instructor:	Damir Kralj, PhD, college professor
Course assistant:	-
Study programme and specialization in which the course is taught:	Specialist graduate professional study of Safety and Protection Engineering - Protection at Work (part-time study)
ECTS credits:	7
Semester of the course execution:	III
Exam prerequisites:	-
Course objectives:	The aim of the course is to acquaint students with the basic methods and procedures of introducing and/or expanding computer-supported information systems with a special emphasis on proactive action within their future work environment. Therefore, to train students to be able to understand, carry out and improve the process of digital transformation, both in the field of security and protection, as well as in all other areas of human activities. Students will get acquainted with some of the versions of program support available on the market for keeping records of occupational safety, environmental protection and fire protection.

Course structure

Teaching mode	Number of contact hours per semester:	Student's requirements per teaching mode
Lectures:	30	presence of min. 60%
Exercises (auditory, linguistics):	45	presence of min. 60%
Exercises (laboratory, practical):		
Field work:		
Other:		
TOTAL:	75	

Monitoring of students' work and knowledge evaluation during the course

OUTCOMES		Colloquium	Seminary work and presentation	Final exam (or preliminary exam)	Total	Pass	Time frame for the recognition of the outcome
Outcome 1	Explain the main reasons and goals for the introduction of computer-supported information systems in business			8%	8%	4%	Until the end of ac. year
Outcome 2	Present the basic methods			8%	8%	4%	Until the end of ac.

	of analysis and design of information systems						year
Outcome 3	Classify possible factors of risk and failure when introducing new information systems			8%	8%	4%	Until the end of ac. year
Outcome 4	Differentiate and independently apply the basic methods and tools of process and data modeling	30%			30%	15%	Until the end of ac. year
Outcome 5	Assess the types of harmful effects and ways of their prevention			8%	8%	4%	Until the end of ac. year
Outcome 6	Illustrate the methods of selecting software, computer and network support of the information system			8%	8%	4%	Until the end of ac. year
Outcome 7	Independently analyze and evaluate the quality and security of modern information and communication solutions		30%		30%	15%	Until the end of ac. year
Total % grade points		30	30	40	100	50	
Share in ECTS		2,1	2,1	2,8			

Knowledge evaluation on exams

Exam prerequisites					
OUTCOMES		**Written exam**	**Oral exam**	**Total**	**Pass**
Outcome 1	Explain the main reasons and goals for the introduction of computer-	4%	4%	8%	4%

	supported information systems in business				
Outcome 2	Present the basic methods of analysis and design of information systems	4%	4%	8%	4%
Outcome 3	Classify possible factors of risk and failure when introducing new information systems	4%	4%	8%	4%
Outcome 4	Differentiate and independently apply the basic methods and tools of process and data modeling	30%		30%	15%
Outcome 5	Assess the types of harmful effects and ways of their prevention	4%	4%	8%	4%
Outcome 6	Illustrate the methods of selecting software, computer and network support of the information system	4%	4%	8%	4%
Outcome 7	Independently analyze and evaluate the quality and security of modern information and communication solutions	20%	10%	30%	15%
Total % of grade points		70%	30%	100%	50%
Share in ECTS		3,5	1,5	5	

Review of units per week with associated learning outcomes

Week	Lecture course content and learning outcomes:	Outcome	Exercises course content and learning outcomes:	Outcome
1.	Introduction to the course, definitions of basic terms	I1	Acquaintance with the equipment in the IT cabinet and the rules of conduct during exercises, analysis of the content of the exercises, the basics of using the available computer and software support	I1, I4
2.	Analysis of the relationship between the existing business (PS) and the planned information system (IS)	I1	Microsoft Excel: creation of simple records, data formatting, sorting and searching of workbook tables	I1, I4
3.	Basic principles, methods and techniques of IS planning and design	I2	Microsoft Excel: automation of data entry, standardized data exchange with other software tools and databases	I2, I4
4.	Comparison of the most frequently used methodologies for IS planning and design	I2	Microsoft Visio: display of the working environment, familiarization with templates, design of the working area (pages)	I2, I4
5.	Roles and tasks of participants in the planning and design process of IS	I2	Microsoft Visio: creation of organizational charts	I2, I4
6.	Analysis of possible risk factors and failures when introducing new IS	I3	Microsoft Visio: creation of E-V diagrams	I2, I4
7.	Basics of modeling procedures and data. Comparison of entities and objects	I4	Microsoft Access: view of the working environment, organization and overview of development tools	I2, I4
8.	Formatting the entity-relationship diagram. Application of MS Visio tools	I4	Microsoft Access: formatting data tables (intension, extension)	I4
9.	Analysis of the most common entity types within an IS. Attributes and their domains	I4	Microsoft Access: data import from other tools, normalization of table records imported from MS Excel	I4

10.	Basics of databases (relational, object, XML). Application of MS Access tools	I4	Microsoft Access: relational links and referential integrity	I4
11.	Methods of normalization of relational databases	I4	Microsoft Access: designing screen forms for entering, viewing and deleting data	I4
12.	Selection of software, computer and network support of the information system	I6	Microsoft Access: formatting various types of SQL queries and reports	I4
13.	Information system protection against data loss and harmful external influences	I5	Workshop: Lecture and analysis of a specific program solution for OS/FP management	I7
14.	Specifics of the information subsystems for the management of OS, EP and FP within the information system of a company. Analysis of strategic and tactical elements	I2, I4, I6, I7	Training in independent creation of tasks	I4
15.	An overview of the possibilities of some versions of software support available on the market for keeping OS, EP and FP records	I7	Colloquium	

References (compulsory / additional)

Compulsory:

6. Kralj, D., Informacijski sustavi u sigurnosti i zaštiti Udžbenik za studente stručnog diplomskog studija Sigurnosti i zaštite, Veleučilište u Karlovcu, Karlovac, 2024.
7. Kralj. D., Primjena računala, Veleučilište u Karlovcu, Karlovac, 2018.
8. Strahonja, V., Varga, M., Pavlić, M., Projektiranje informacijskih sustava – Metodološki priručnik, Zavod za informatičku djelatnost Hrvatske i INA - INFO, Zagreb, 1992.
9. ITdesk.Info, Microsoft Office 2010, ODRAZI, Zagreb, 2011.
10. ITdesk.Info, Računalna sigurnost, CARNET, Zagreb, 2011.

Additional:

8. Ross, CW, Computer Systems for Occupational Safety and Health Management – 2nd ed.,Marcel Dekker Inc., NewYork, 1991.
9. Fertalj, K., Kalpić, D., Projektiranje informacijskih sustava,Sveučilište u Zagrebu, FER – ZPR, 2006.
10. Luić, Lj., Informacijski sustavi Veleučilište u Karlovcu, Karlovac, 2009.
11. EVIZ, www.zitel.hr, ZITEL, Zagreb
12. WebZNR, www.linijakoda.hr, Zagreb
13. EVIDENKO, www.zirs.hr, Zavod za istraživanje i razvoj sigurnosti, Zagreb
14. Sinarm, www.sinarm.net, Web IT, Osijek

VELEUČILIŠTE U KARLOVCU
Karlovac University of Applied Sciences

COURSE SYLLABUS

General information

Course title:	Computer Aided Fire Protection Management
ISVU course code:	165910
Course instructor:	Damir Kralj, PhD, college professor
Course assistant:	-
Study programme and specialization in which the course is taught:	Specialist graduate professional study of Safety and Protection Engineering – Fire Protection (full-time study)
ECTS credits:	6
Semester of the course execution:	II
Exam prerequisites:	-
Course objectives:	The aim of the course is to acquaint students with the basic methods and procedures of introducing and/or expanding computer-supported information systems with a special emphasis on proactive action within their future work environment. Therefore, to train students to be able to understand, carry out and improve the process of digital transformation, both in the field of security and protection, as well as in all other areas of human activities. Students will get acquainted with some of the versions of program support available on the market for keeping FP records, as well as with the e-HVZ project and structure.

Course structure

Teaching mode	Number of contact hours per semester:	Student's requirements per teaching mode
Lectures:	30	presence of min. 80%
Exercises (auditory, linguistics):	45	presence of min. 80%
Exercises (laboratory, practical):		
Field work:		
Other:		
TOTAL:	75	

Monitoring of students' work and knowledge evaluation during the course

OUTCOMES		Colloquium	Seminary work and presentation	Final exam (or preliminary exam)	Total	Pass	Time frame for the recognition of the outcome
Outcome 1	Explain the main reasons and goals for the introduction of computer-supported information systems in business			8%	8%	4%	Until the end of ac. year
Outcome 2	Present the basic methods			8%	8%	4%	Until the end of ac.

	of analysis and design of information systems						year
Outcome 3	Classify possible factors of risk and failure when introducing new information systems			8%	8%	4%	Until the end of ac. year
Outcome 4	Differentiate and independently apply the basic methods and tools of process and data modeling	30%			30%	15%	Until the end of ac. year
Outcome 5	Assess the types of harmful effects and ways of their prevention			8%	8%	4%	Until the end of ac. year
Outcome 6	Illustrate the methods of selecting software, computer and network support of the information system			8%	8%	4%	Until the end of ac. year
Outcome 7	Independently analyze and evaluate the quality and security of modern information and communication solutions		30%		30%	15%	Until the end of ac. year
Total % grade points		30	30	40	100	50	
Share in ECTS		1,8	1,8	2,4			

Knowledge evaluation on exams

Exam prerequisites					
OUTCOMES		**Written exam**	**Oral exam**	**Total**	**Pass**
Outcome 1	Explain the main reasons and goals for the introduction of computer-	4%	4%	8%	4%

	supported information systems in business				
Outcome 2	Present the basic methods of analysis and design of information systems	4%	4%	8%	4%
Outcome 3	Classify possible factors of risk and failure when introducing new information systems	4%	4%	8%	4%
Outcome 4	Differentiate and independently apply the basic methods and tools of process and data modeling	30%		30%	15%
Outcome 5	Assess the types of harmful effects and ways of their prevention	4%	4%	8%	4%
Outcome 6	Illustrate the methods of selecting software, computer and network support of the information system	4%	4%	8%	4%
Outcome 7	Independently analyze and evaluate the quality and security of modern information and communication solutions	20%	10%	30%	15%
Total % of grade points		70%	30%	100%	50%
Share in ECTS		4.2	1,8	6	

Review of units per week with associated learning outcomes

Week	Lecture course content and learning outcomes:	Outcome	Exercises course content and learning outcomes:	Outcome
1.	Introduction to the course, definitions of basic terms	I1	Acquaintance with the equipment in the IT cabinet and the rules of conduct during exercises, analysis of the content of the exercises, the basics of using the available computer and software support	I1, I4
2.	Analysis of the relationship between the existing business (PS) and the planned information system (IS)	I1	Microsoft Excel: creation of simple records, data formatting, sorting and searching of workbook tables	I1, I4
3.	Basic principles, methods and techniques of IS planning and design	I2	Microsoft Excel: automation of data entry, standardized data exchange with other software tools and databases	I2, I4
4.	Comparison of the most frequently used methodologies for IS planning and design	I2	Microsoft Visio: display of the working environment, familiarization with templates, design of the working area (pages)	I2, I4
5.	Roles and tasks of participants in the planning and design process of IS	I2	Microsoft Visio: creation of organizational charts	I2, I4
6.	Analysis of possible risk factors and failures when introducing new IS	I3	Microsoft Visio: creation of E-V diagrams	I2, I4
7.	Basics of modeling procedures and data. Comparison of entities and objects	I4	Microsoft Access: view of the working environment, organization and overview of development tools	I2, I4
8.	Formatting the entity-relationship diagram. Application of MS Visio tools	I4	Microsoft Access: formatting data tables (intension, extension)	I4
9.	Analysis of the most common entity types within an IS. Attributes and their domains	I4	Microsoft Access: data import from other tools, normalization of table records imported from MS Excel	I4

10.	Basics of databases (relational, object, XML). Application of MS Access tools	I4	Microsoft Access: relational links and referential integrity	I4
11.	Methods of normalization of relational databases	I4	Microsoft Access: designing screen forms for entering, viewing and deleting data	I4
12.	Selection of software, computer and network support of the information system	I6	Microsoft Access: formatting various types of SQL queries and reports	I4
13.	Information system protection against data loss and harmful external influences	I5	Workshop: Presentations of seminar papers	I7
14.	Specifics of the information subsystems for the management of OS, EP and FP within the information system of a company. Analysis of strategic and tactical elements	I2, I4, I6, I7	Training in independent creation of tasks	I4
15.	Analysis of the organization and overview of the possibilities of the e-HVZ information system	I7	Colloquium	

References (compulsory / additional)

Compulsory:

11. Kralj, D., Informacijski sustavi u sigurnosti i zaštiti: Udžbenik za studente stručnog diplomskog studija Sigurnosti i zaštite, Veleučilište u Karlovcu, Karlovac, 2024.
12. Kralj. D., Primjena računala, Veleučilište u Karlovcu, Karlovac, 2018.
13. Strahonja, V., Varga, M., Pavlić, M., Projektiranje informacijskih sustava – Metodološki priručnik, Zavod za informatičku djelatnost Hrvatske i INA - INFO, Zagreb, 1992.
14. ITdesk.Info, Microsoft Office 2010, ODRAZI, Zagreb, 2011.
15. ITdesk.Info, Računalna sigurnost, CARNET, Zagreb, 2011.

Additional:

15. Ross, CW, Computer Systems for Occupational Safety and Health Management – 2nd ed.,Marcel Dekker Inc., NewYork, 1991.
16. Fertalj, K., Kalpić, D., Projektiranje informacijskih sustava,Sveučilište u Zagrebu, FER – ZPR, 2006.
17. Luić, Lj., Informacijski sustavi Veleučilište u Karlovcu, Karlovac, 2009.
18. EVIZ, www.zitel.hr, ZITEL, Zagreb
19. WebZNR, www.linijakoda.hr, Zagreb
20. EVIDENKO, www.zirs.hr, Zavod za istraživanje i razvoj sigurnosti, Zagreb
21. Sinarm, www.sinarm.net, Web IT, Osijek

VELEUČILIŠTE U KARLOVCU
Karlovac University of Applied Sciences

COURSE SYLLABUS

General information

Course title:	Computer Aided Fire Protection Management
ISVU course code:	83319
Course instructor:	Damir Kralj, PhD, college professor
Course assistant:	-
Study programme and specialization in which the course is taught:	Specialist graduate professional study of Safety and Protection Engineering – Fire Protection (part-time study)
ECTS credits:	6
Semester of the course execution:	II
Exam prerequisites:	-
Course objectives:	The aim of the course is to acquaint students with the basic methods and procedures of introducing and/or expanding computer-supported information systems with a special emphasis on proactive action within their future work environment. Therefore, to train students to be able to understand, carry out and improve the process of digital transformation, both in the field of security and protection, as well as in all other areas of human activities. Students will get acquainted with some of the versions of program support available on the market for keeping FP records, as well as with the e-HVZ project and structure.

Course structure

Teaching mode	Number of contact hours per semester:	Student's requirements per teaching mode
Lectures:	30	presence of min. 60%
Exercises (auditory, linguistics):	45	presence of min. 60%
Exercises (laboratory, practical):		
Field work:		
Other:		
TOTAL:	75	

Monitoring of students' work and knowledge evaluation during the course

OUTCOMES		Colloquium	Seminary work and presentation	Final exam (or preliminary exam)	Total	Pass	Time frame for the recognition of the outcome
Outcome 1	Explain the main reasons and goals for the introduction of computer-supported information systems in business			8%	8%	4%	Until the end of ac. year
Outcome 2	Present the basic methods			8%	8%	4%	Until the end of ac.

	of analysis and design of information systems						year
Outcome 3	Classify possible factors of risk and failure when introducing new information systems			8%	8%	4%	Until the end of ac. year
Outcome 4	Differentiate and independently apply the basic methods and tools of process and data modeling	30%			30%	15%	Until the end of ac. year
Outcome 5	Assess the types of harmful effects and ways of their prevention			8%	8%	4%	Until the end of ac. year
Outcome 6	Illustrate the methods of selecting software, computer and network support of the information system			8%	8%	4%	Until the end of ac. year
Outcome 7	Independently analyze and evaluate the quality and security of modern information and communication solutions		30%		30%	15%	Until the end of ac. year
Total % grade points		30	30	40	100	50	
Share in ECTS		1,8	1,8	2,4			

Knowledge evaluation on exams

Exam prerequisites					
OUTCOMES		**Written exam**	**Oral exam**	**Total**	**Pass**
Outcome 1	Explain the main reasons and goals for the introduction of computer-	4%	4%	8%	4%

	supported information systems in business				
Outcome 2	Present the basic methods of analysis and design of information systems	4%	4%	8%	4%
Outcome 3	Classify possible factors of risk and failure when introducing new information systems	4%	4%	8%	4%
Outcome 4	Differentiate and independently apply the basic methods and tools of process and data modeling	30%		30%	15%
Outcome 5	Assess the types of harmful effects and ways of their prevention	4%	4%	8%	4%
Outcome 6	Illustrate the methods of selecting software, computer and network support of the information system	4%	4%	8%	4%
Outcome 7	Independently analyze and evaluate the quality and security of modern information and communication solutions	20%	10%	30%	15%
Total % of grade points		70%	30%	100%	50%
Share in ECTS		4.2	1,8	6	

Review of units per week with associated learning outcomes

Week	Lecture course content and learning outcomes:	Outcome	Exercises course content and learning outcomes:	Outcome
1.	Introduction to the course, definitions of basic terms	I1	Acquaintance with the equipment in the IT cabinet and the rules of conduct during exercises, analysis of the content of the exercises, the basics of using the available computer and software support	I1, I4
2.	Analysis of the relationship between the existing business (PS) and the planned information system (IS)	I1	Microsoft Excel: creation of simple records, data formatting, sorting and searching of workbook tables	I1, I4
3.	Basic principles, methods and techniques of IS planning and design	I2	Microsoft Excel: automation of data entry, standardized data exchange with other software tools and databases	I2, I4
4.	Comparison of the most frequently used methodologies for IS planning and design	I2	Microsoft Visio: display of the working environment, familiarization with templates, design of the working area (pages)	I2, I4
5.	Roles and tasks of participants in the planning and design process of IS	I2	Microsoft Visio: creation of organizational charts	I2, I4
6.	Analysis of possible risk factors and failures when introducing new IS	I3	Microsoft Visio: creation of E-V diagrams	I2, I4
7.	Basics of modeling procedures and data. Comparison of entities and objects	I4	Microsoft Access: view of the working environment, organization and overview of development tools	I2, I4
8.	Formatting the entity-relationship diagram. Application of MS Visio tools	I4	Microsoft Access: formatting data tables (intension, extension)	I4
9.	Analysis of the most common entity types within an IS. Attributes and their domains	I4	Microsoft Access: data import from other tools, normalization of table records imported from MS Excel	I4

10.	Basics of databases (relational, object, XML). Application of MS Access tools	I4	Microsoft Access: relational links and referential integrity	I4
11.	Methods of normalization of relational databases	I4	Microsoft Access: designing screen forms for entering, viewing and deleting data	I4
12.	Selection of software, computer and network support of the information system	I6	Microsoft Access: formatting various types of SQL queries and reports	I4
13.	Information system protection against data loss and harmful external influences	I5	Workshop: Presentations of seminar papers	I7
14.	Specifics of the information subsystems for the management of OS, EP and FP within the information system of a company. Analysis of strategic and tactical elements	I2, I4, I6, I7	Training in independent creation of tasks	I4
15.	Analysis of the organization and overview of the possibilities of the e-HVZ information system	I7	Colloquium	

References (compulsory / additional)

Compulsory:

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Additional:

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24. Luić, Lj., Informacijski sustavi Veleučilište u Karlovcu, Karlovac, 2009.
25. EVIZ, www.zitel.hr, ZITEL, Zagreb
26. WebZNR, www.linijakoda.hr, Zagreb
27. EVIDENKO, www.zirs.hr, Zavod za istraživanje i razvoj sigurnosti, Zagreb
28. Sinarm, www.sinarm.net, Web IT, Osijek

VELEUČILIŠTE U KARLOVCU
Karlovac University of Applied Sciences

COURSE SYLLABUS

General information

Course title:	**Fire Investigation Methods**
ISVU course code:	165911, 83320
Course instructor:	Lidija Jakšić, mag. ing. cheming., lecturer
Course assistant:	-
Study programme and specialization in which the course is taught:	Professional graduate study programme with master thesis – Fire protection
ECTS credits:	7.0
Semester of the course execution:	II
Exam prerequisites:	No prerequisites
Course objectives:	The aim of the course is to impart to students the knowledge and skills of professional search, recognition and interpretation of significant types and forms of traces and other important clues that enable the discovery and determination of the place (origin and center), causes, conditions and circumstances of the occurrence of a fire or explosion, for the purposes of official, i.e. expert or scientific-research analysis of the characteristics of such events.

Course structure

Teaching mode	Number of contact hours per semester:	Student's requirements per teaching mode
Lectures:	45	attendance 80%
Exercises (auditory, linguistics):	30	attendance 100%
Exercises (laboratory, practical):		
Field work:		
Other:		
TOTAL:	75	

Monitoring of students' work and knowledge evaluation during the course

OUTCOMES		Partial exam 1	Partial exam 2	Oral	Total	Pass	Time frame for the recognition of the outcome
Outcome 1	**O1:** Classify and recognize possible types/forms, ways, causes, conditions and circumstances of fire or explosions, i.e. significant modus operandi of probably intentional acts of arson or causing explosions.	10		6	16	8	Until the end of the academic year
Outcome 2	**O2:** Anticipate and warn of possible deaths and methods of protection for all research participants at the scene of fires or explosions and	10		6	16	8	Until the end of the academic year

	propose to the scene of fires or explosions an appropriate composition of the team of experts, necessary investigative equipment, optimal method of access and investigative work.						
Outcome 3	**O3:** Propose and organize the work process of the team of experts appropriate to the specific type and special features of the place and traces of fire or explosions or the execution of an arson/explosive attack.	10		6	16	8	Until the end of the academic year
Outcome 4	**O4:** Discover significant material traces of fires or explosions, the use of dangerous substances and sources of fires or explosions of dangerous energy, i.e. significant modus operandi of possibly deliberately caused fires or explosions, for the purposes of carrying out further forensic expertise and other types of investigation and connect possible traces of fires or explosions of dangerous substances with traces of possible ignition or activation energy sources and the modus operandi of causing fires or explosions.		10	6	16	8	Until the end of the academic year
Outcome 5	**O5:** Develop all realistically possible preliminary hypotheses about the possible causes		10	6	16	8	Until the end of the academic year

	and ways of occurrence of a case of fire or explosion, i.e. about the possible modus operandi of causing a fire or explosion, and propose the implementation of other necessary investigative actions of potential evidentiary value, appropriate to the type/traceological features of the fire or explosion or performance fire or explosion attack.						
Outcome 6	**O6:** Match the results of the expert examination with the construction components of the preliminary investigative hypotheses about the cause/method of occurrence of the fire or explosion and choose the hypothesis that, without any possible doubt, is confirmed by all the results/findings of the expert examination and other investigative actions carried out.		10	10	20	10	Until the end of the academic year
Total % grade points		30	30	40	100	50	
Share in ECTS		2,1	2,1	2,8	7,0		

Knowledge evaluation on exams

Exam prerequisites	Attendance				
OUTCOMES		**Written exam**	**Oral exam**	**Total**	**Pass**
Outcome 1	**O1:** Classify and recognize possible types/forms, ways, causes, conditions and circumstances of fire or explosions, i.e. significant modus operandi of probably intentional acts of arson or causing explosions.	10	6	16	8
Outcome 2	**O2:** Anticipate and warn of possible deaths and methods of protection for all research participants at the	10	6	16	8

	scene of fires or explosions and propose to the scene of fires or explosions an appropriate composition of the team of experts, necessary investigative equipment, optimal method of access and investigative work.				
Outcome 3	**O3:** Propose and organize the work process of the team of experts appropriate to the specific type and special features of the place and traces of fire or explosions or the execution of an arson/explosive attack.	10	6	16	8
Outcome 4	**O4:** Discover significant material traces of fires or explosions, the use of dangerous substances and sources of fires or explosions of dangerous energy, i.e. significant modus operandi of possibly deliberately caused fires or explosions, for the purposes of carrying out further forensic expertise and other types of investigation and connect possible traces of fires or explosions of dangerous substances with traces of possible ignition or activation energy sources and the modus operandi of causing fires or explosions.	10	6	16	8
Outcome 5	**O5:** Develop all realistically possible preliminary hypotheses about the possible causes and ways of occurrence of a case of fire or explosion, i.e. about the possible modus operandi of causing a fire or explosion, and propose the implementation of other necessary investigative actions of potential evidentiary value, appropriate to the type/traceological features of the fire or explosion or performance fire or explosion attack.	10	6	16	8
Outcome 6	**O6:** Match the results of the expert examination with the construction components of the preliminary investigative hypotheses about the cause/method of occurrence of the fire or explosion and choose the hypothesis that, without any possible doubt, is confirmed by all the results/findings of the expert examination and other investigative actions carried out.	10	10	20	10
Total % of grade points		60	40	100	50
Share in ECTS		4,2	2,8	7,0	

Review of units per week with associated learning outcomes

Week	Lecture course content and learning outcomes:	Outcome	Exercises course content and learning outcomes:	Outcome
1.	Terms and investigative (evidential/forensic) important general characteristics of possible types, ways, causes, conditions and special circumstances of the occurrence of fires or explosions (the subject of official, professional or scientific research of such types of dangerous and harmful events)	O1	Analyze video and pictorial examples of investigatively important components of the possible appearance of traces of the wider fire scene of buildings, vehicles, vessels and (forest) vegetation.	O1
2.	Possible layout of the scene, types of possible deaths and ways to protect research participants from fire or explosions or other dangerous substances or energy in certain places ravaged by fire or explosion.	O2	Analysis of video and pictorial examples of investigatively important components of the possible appearance of traces of the narrow place of the fire of buildings, vehicles, vessels and (forest) vegetation.	O1
3.	At the scene of a fire or explosion or the execution of an arson/explosive attack, the professional composition of the team of experts, the necessary investigative equipment and the choice of methods of access and performance of investigative work.	O3	Analysis of video and pictorial examples of investigatively important components of the possible appearance of traces of a wider and narrower place of a physical explosion within buildings, vehicles, vessels and open space.	O1
4.	Stages of the work process and procedures of the expert team depending on the type and special features of the place and traces of fire or explosions or execution of an arson/explosive attack.	O3	Analysis of video and pictorial examples of investigatively important components of the possible appearance of traces of a wider and narrower site of a chemical explosion of a substance in a diluted phase within a building, vehicle, vessel and open space: I1	O1
5.	Possible significant material traces and other indications that indicate the possible type, origin and some special characteristics of the resulting fire or explosion of combustible or explosive substances, or vessels under overpressure.	O4	Analysis of video and pictorial examples of investigatively important components of the possible appearance of traces of a wider and narrower site of a chemical explosion of substances in the condensed phase within buildings, vehicles, vessels and open space.	O1
6.	Possible specific material traces and other indications that point to certain groups or special types of flammable, explosive, oxidizing and catalytic substances at the origin of the fire, i.e. in the center (place of initiation) of the explosion.	O4	Examples of determining the zone of necessary police protection of the wider scene of a fire or explosion, as well as ways and means of protecting potentially important investigative traces from loss, removal or destruction.	O2
7.	Possible specific material traces and other indications that indicate the absence of the necessary presence/protective action of a	O4	Examples of methods, means and procedures for checking, removing or avoiding possible types of death from damaged structures and dangerous	O3

	particular group or special type of inert, inhibitory or anticatalytic substance.		substances, objects or energy inside burnt buildings.	
8.	Possible specific material traces and other indications that indicate certain groups or special types of ignition energy sources, i.e. the method of initiation, or the modus operandi (MOS) during the preparation and execution of the act of arson, i.e. the intentional causing of the explosion.	O4	Examples of planning the shape and size of the inspection area for the scene of a fire or explosion and the way the investigator moves when inspecting the scene of such events.	O4
9.	Methods, techniques, means and procedures for properly marking, securing, fixing, removing, packaging and protecting investigative/forensically important macro and micro traces at the scene of fires or explosions.	O4	Examples of the choice of methods, means and procedures for marking and fixing investigatively important traces.	O4
10.	Methods and techniques of conducting investigative experiments "in situ" and forensic experiments in small or actual proportions of possible evidentiary importance for the detection and clarification of certain doubtful causes, effects and consequences of fires or explosions.	O4	Analysis of video and image typical examples of material traces that undoubtedly indicate the type, origin and special features of the cause of the fire, i.e. the type, center and special features of the cause of the explosion of combustible or explosive substances, or the explosion/implosion of containers under over/under pressure.	O4
11.	Available forensic laboratory methods and techniques for carrying out the necessary analyzes of micro traces of possible evidential importance for the detection and clarification of the causes, effects and consequences of fires or explosions.	O4	Analysis of video and image typical examples of material traces that undoubtedly indicate a group of combustible substances, i.e. explosive substances, at the origin of the fire/center of the explosion.	O4
12.	Methods and techniques of developing and verifying the possible forensic sustainability of preliminary hypotheses about the possible causes and ways of occurrence of the investigated case of fire or explosion, or about the possible modus operandi of causing the fire or explosion, based on the results of the examination of possible material evidence.	O5	Analysis of video and pictorial typical examples of material traces that undoubtedly indicate a group or a special type of ignition energy source, i.e. the method of initiation, or the modus operandi (MOS) during the preparation and execution of the act of arson, i.e. the intentional causing of an explosion.	O4
13.	Subjects and documents of expert examination of the cause of fire or explosion and their mandatory content and attachments.	O6	Analysis of video and pictorial examples of typical material traces that undoubtedly indicate malfunctions of technical systems for fire alarm, gas and manual/(semi)automatic extinguishing.	O4
14.	Basic professional and ethical principles of expert examination of the causes of fires or explosions.	O6	Practical development and elaboration of preliminary investigative hypotheses about possible causes, conditions, circumstances and ways of	O5

			occurrence of selected examples of fire and explosion cases.	
15.	Content and methods of presentation of expert findings on the cause of fires or explosions in court proceedings.	O6	Practical review of preliminary investigation hypotheses about possible causes, conditions, circumstances and ways of occurrence of practice-selected examples of cases of fires or explosions based on facts collected by eyewitnesses and forensic laboratory analyzes of (micro)traces.	O6

References (compulsory / additional)

Compulsory:
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Pačelat, R., Zorić, Z. (2003). *Istraživanje uzroka požara*, Zavod za istraživanje i razvoj sigurnosti (ZIRS), Zagreb.
Kulišić, D. (2011). The benefits from using professionally developed models of possible hazardous materials accident scenarios in crime scene investigation, Gl. 9, U: *Managing Global Environmental Threats to Air, Water and Soil - Examples from South Eastern Europe*, pp. 151-186., Springer (NATO Science for Peace and Security Series - C: Environmental Security). Meško, G., Dimitrijević, D. & Fields, C.B. (Eds.), Dordrecht.
Kulišić, D. (2015). Prepoznatljiva i dokazno važna obilježja praktičkih izvora energije paljenja u sklopu sustava s brojnijim i/ili složenijim požarnim i eksplozijskim opasnostima, *Zbornik radova IV. međunarodne znanstveno-stručne konferencije „Istraživački dani Visoke policijske škole u Zagrebu"*, Butorac, K. (ur.), str. 586.-612., Zagreb, 23.-24. travnja 2015., Zagreb: Visoka policijska škola MUP-a RH. (dostupno na: http://www.policija.hr/211645.aspx).
Kulišić, D. (2008). Indicije paleži zloporabom gorivih kapljevina, Zbornik radova „II. međunarodnog stručno-znanstvenog skupa *Zaštita na radu i zaštita zdravlja*" (24. 09. - 27. 09. 2008., Bjelolasica), str. 405.-409.
Additional:
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Bouquard, T.J. (2004). *Arson investigation: The Step-by-Step Procedure*, 2nd Ed., Charles C. Thomas Publisher, Ltd., Springfield (IL).
Swab, S.E. (1983). *Incendiary Fires: A Reference Manual for Fire Investigators*, Robert J. Brady Co. / Prentice-Hall Publishing and Communications Co., Bowie (MD).
Kästle, H. (1992). *Brandstiftung Erkennen, Aufklären, Verhüten*, Richard Boorberg Verlag GmbH & Co., Stuttgart.
FEMA/USFA (January 1993). *Basic Tools and Resources for Fire Investigators: A Handbook* (FA-127, U.S. Fire Administration/USFA), Federal Emergency Management Agency (FEMA), Washington (DC).
Kulišić, D., Medić, G. (2012). O kriminalistički znakovitim obilježjima požara na osobnim automobilima, *Policija i sigurnost*, **21**, 2; 293.-326.
Kulišić, D. (2014). Motivi paleži, *Zbornik radova „5. međunarodnog stručno-znanstvenog skupa Zaštita na radu i zaštita zdravlja*", Kirin, S. (ur.), str. 660.-669., Zadar (Borik), 17.-20. rujna 2014., Karlovac: Veleučilište u Karlovcu.

VELEUČILIŠTE U KARLOVCU
Karlovac University of Applied Sciences

COURSE SYLLABUS

General information

Course title:	**Expertise of Fire and Explosion**
ISVU course code:	171402, 83322
Course instructor:	Lidija Jakšić, mag. ing. cheming., lecturer
Course assistant:	-
Study programme and specialization in which the course is taught:	Professional graduate study programme with master thesis – Fire protection
ECTS credits:	6.0
Semester of the course execution:	III
Exam prerequisites:	No prerequisites
Course objectives:	Teach a student about general structure, specific contents and the most useful elements of contemporary scientific, forensic and professional praxis for investigating and determining kinds/patterns, manners, causes, conditions, circumstances, effects and consequences of fires and explosions occurrences; about professional selection and application of most appropriate scientific/forensic methods and techniques in fire/explosion cause determination in different simple and complex fire/explosion cases and investigative situations; about system of effective measures, procedures and activities for timely and skilfully avoiding typical investigative omissions, oversights and mistakes which could jeopardize reliability and credibility of the results of forensic fire/explosion cause determination; about content and manners of preparing documents for court expert testimony and opinion testimony and, finally, about court rules and usual professional praxis of presenting and defending results of an fire/explosion expertise.

Course structure

Teaching mode	Number of contact hours per semester:	Student's requirements per teaching mode
Lectures:	30	attendance 80%
Exercises (auditory, linguistics):	45	attendance 100%
Exercises (laboratory, practical):		
Field work:		
Other:		
TOTAL:	75	

Monitoring of students' work and knowledge evaluation during the course

OUTCOMES		Partial exam 1	Partial exam 2	Oral	Total	Pass	Time frame for the recognition of the outcome
Outcome 1	**O1:** List and explain role of all fields, branches and kinds of forensic sciences, different kinds of professions, handicrafts and skills especially useful for	10		6	16	8	Until the end of the academic year

	researching, testing and determining possible evidence of all most probable kinds/patterns, manners, causes, conditions, circumstances, effects and consequences of fires and explosions occurrences.						
Outcome 2	**O2:** Recognize possible characteristic fire/explosion scene circumstantial and physical evidence in damaged or destroyed residential or public buildings and recommend appropriate kinds, techniques and purposes of testing of that evidence *in situ* and/or in forensic laboratory.	10		6	16	8	Until the end of the academic year
Outcome 3	**O3:** Recognize possible characteristic fire/explosion scene circumstantial and physical evidence in damaged or destroyed industrial buildings, process plants and process units and recommend appropriate kinds, techniques and purposes of testing of that evidence *in situ* and/or in forensic laboratory.	10		6	16	8	Until the end of the academic year
Outcome 4	**O4:** Recognize possible characteristic fire/explosion scene circumstantial and physical evidence in damaged or destroyed kinds of passenger and goods transport		10	6	16	8	Until the end of the academic year

	vehicles/objects and recommend appropriate kinds, techniques and purposes of testing of that evidence *in situ* and/or in forensic laboratory.						
Outcome 5	**O5:** Recognize possible characteristic fire/explosion scene circumstantial and physical evidence of wood and wildland fires or fires in agricultural areas, and recommend appropriate kinds, techniques and purposes of testing of that evidence *in situ* and/or in forensic laboratory.		10	6	16	8	Until the end of the academic year
Outcome 6	**O6:** Search for information/data in available professional and scientific data bases, and formulate, publicly present and defend results of his expertise about (un)determined fire/explosion cause, manner, conditions, circumstances, effects and consequences of the occurrence.		10	10	20	10	Until the end of the academic year
Total % grade points		30	30	40	100	50	
Share in ECTS		1,8	1,8	2,4	6,0		

Knowledge evaluation on exams

Exam prerequisites	Attendance				
OUTCOMES		**Written exam**	**Oral exam**	**Total**	**Pass**
Outcome 1	**O1:** List and explain role of all fields, branches and kinds of forensic sciences, different kinds of professions, handicrafts and skills especially useful for researching, testing and determining possible evidence of all most probable	10	6	16	8

	kinds/patterns, manners, causes, conditions, circumstances, effects and consequences of fires and explosions occurrences.				
Outcome 2	**O2:** Recognize possible characteristic fire/explosion scene circumstantial and physical evidence in damaged or destroyed residential or public buildings and recommend appropriate kinds, techniques and purposes of testing of that evidence *in situ* and/or in forensic laboratory.	10	6	16	8
Outcome 3	**O3:** Recognize possible characteristic fire/explosion scene circumstantial and physical evidence in damaged or destroyed industrial buildings, process plants and process units and recommend appropriate kinds, techniques and purposes of testing of that evidence *in situ* and/or in forensic laboratory.	10	6	16	8
Outcome 4	**O4:** Recognize possible characteristic fire/explosion scene circumstantial and physical evidence in damaged or destroyed kinds of passenger and goods transport vehicles/objects and recommend appropriate kinds, techniques and purposes of testing of that evidence *in situ* and/or in forensic laboratory.	10	6	16	8
Outcome 5	**O5:** Recognize possible characteristic fire/explosion scene circumstantial and physical evidence of wood and wildland fires or fires in agricultural areas, and recommend appropriate kinds, techniques and purposes of testing of that evidence *in situ* and/or in forensic laboratory.	10	6	16	8
Outcome 6	**O6:** Search for information/data in available professional and scientific data bases, and formulate, publicly present and defend results of his expertise about (un)determined fire/explosion cause, manner, conditions, circumstances, effects and consequences of the occurrence.	10	10	20	10
Total % of grade points		60	40	100	50
Share in ECTS		3,6	2,4	6,0	

Review of units per week with associated learning outcomes

Week	Lecture course content and learning outcomes:	Outcome	Exercises course content and learning outcomes:	Outcome
1.	Methods and techniques in contemporary scientific, forensic and other professional praxis of	O1	Case study and critical analysis of results and used methods and techniques in a case of investigation	O2, O6

	investigating and determining kinds/patterns, manners, causes, conditions, circumstances, effects and consequences of fires and explosions occurrences.		and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire occurrence in a typical kind of residential building.	
2.	Fields, branches and kinds of forensic sciences, different kinds of professions, handicrafts and skills which can be especially useful or crucially important for researching, testing and determining possible evidence of all most probable kinds/patterns, manners, causes, conditions, circumstances, effects and consequences of fires and explosions occurrences.	O1	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of gas explosion occurrence in a typical kind of residential building.	O2, O6
3.	Overview of kinds and general investigative possibilities of most often used methods and techniques in contemporary forensic chemistry, biochemistry, chemical engineering and technology, pyrotechnology, thermodynamics, ballistics, electrotechnics, electronics, mechanical engineering, civil engineering, medicine, toxicology, ecology etc., for performing forensic analysis of investigative relevant kinds, shapes and patterns of physical and circumstantial evidence at fire/explosion scene and in forensic lab.	O1	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire or gas explosion occurrence in a typical kind of small handicraft buildings.	O2, O6
4.	Possible specific forensic issues and methods/techniques for expert fire or explosion cause investigation in the cases of typical kinds of residential and small handicraft buildings.	O2, O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire occurrence in a typical kind of hotel, hostel, college/students' boarding-house or night club.	O2, O6
5.	Possible specific forensic issues and methods/techniques for expert fire or explosion cause investigation in the cases of typical kinds of public buildings for trading, tourism, culture, amusement and sport.	O2, O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire occurrence in a typical kind of department store or a kind off city market centre.	O2, O6
6.	Possible specific forensic issues and methods/techniques for expert fire or explosion cause investigation in the cases of typical kinds of public buildings for education, health and social care.	O2, O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire occurrence	O2, O6

			in a typical kind of building for health or social care.	
7.	Possible specific forensic issues and methods/techniques for expert fire or explosion cause investigation in the cases of some typical kinds of industrial buildings, process plants and process units (operations) in oil, petrochemical and pharmaceutical industry.	O3, O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire and/or explosion occurrence in a typical kind of industrial building, process plant or process unit (operation) in oil industry.	O3, O6
8.	Possible specific forensic issues and methods/techniques for expert fire or explosion cause investigation in the cases of some typical kinds of industrial buildings, process plants and process units (operations) in wood-processing, textile, food and alcohol beverage industry.	O3, O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire and/or explosion occurrence in a typical kind of industrial building, process plant or process unit (operation) in petrochemical industry.	O3, O6
9.	Possible specific forensic issues and methods/techniques for expert fire or explosion cause investigation in the cases of typical kinds of passenger and goods transport vehicles, vessels and transport structures (tunnels and pipelines).	O4, O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire and/or explosion occurrence in a typical kind of industrial building, process plant or process unit (operation) in pharmaceutical industry.	O3, O6
10.	Possible specific forensic issues and methods/techniques for expert fire cause investigation in the cases of wood and wildland fires.	O5, O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire and/or explosion occurrence in a typical kind of industrial building, process plant or process unit (operation) in wood-processing or in food or alcohol beverage industry.	O3, O6
11.	Usual investigative omissions, oversights and mistakes which could jeopardize reliability and credibility of the results of fire/explosion cause determination and forensic expertise and system of appropriate measures, procedures and activities for timely avoiding them.	O1 – O5	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire and/or explosion occurrence in a typical kind of industrial building, process	O3, O6

			plant or process unit (operation) in textile industry.	
12.	Addresses and contents of world famous publicly available and internal professional data basis for forensic laboratories and for individual forensic experts.	O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire or explosion occurrence in a typical kind of passenger or goods road/railway transport vehicle or transport structure (tunnel or pipeline).	O4, O6
13.	Contemporary commercial computer software and expert systems for forensic simulation tests and for comparative investigations and analysis of probable causes, conditions and cases of fire/explosion initiation, development, dynamics, effects and consequences in different kinds of spaces and environments.	O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of fire or explosion occurrence in a typical kind of passenger or goods maritime transport, or in a typical kind of port, marina or ship repairing yard.	O4, O6
14.	Rules, manners, means and techniques for preparing documents for court expert testimony and opinion testimony (written documents and photo, video, animated and graphic appendices of expertise about (un)determined fire/explosion cause, manner, conditions, circumstances, effects and consequences of the occurrence).	O2 – O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of wood or wildland fire.	O5, O6
15.	Rules and manners of presenting and defending results of fire/explosion expertise at court.	O6	Case study and critical analysis of results and used methods and techniques in a case of investigation and determination of possible kind/pattern, manner, cause, conditions, circumstances, effects and consequences of agricultural crops/plants fire.	O5, O6

References (compulsory / additional)

Compulsory for Croatian speaking students:

1) Kulišić, D. (2003). *Metodika istraživanja požara i eksplozija*, Samoizdat (Nastavnik), Zagreb.
2) Pačelat, R., Zorić, Z. (2003). *Istraživanje uzroka požara*, Zavod za istraživanje i razvoj sigurnosti (ZIRS), Zagreb.
3) Kulišić, D. (2011). The benefits from using professionally developed models of possible hazardous materials accident scenarios in crime scene investigation, Gl. 9, U: *Managing Global Environmental Threats to Air, Water and Soil - Examples from South Eastern Europe*, pp. 151-186., Springer (NATO Science for Peace and Security Series - C: Environmental Security). Meško, G., Dimitrijević, D. & Fields, C.B. (Eds.), Dordrecht.
4) Kulišić, D. (2015). Prepoznatljiva i dokazno važna obilježja praktičkih izvora energije paljenja u sklopu sustava s brojnijim i/ili složenijim požarnim i eksplozijskim opasnostima, *Zbornik radova IV. međunarodne znanstveno-stručne konferencije „Istraživački dani Visoke policijske škole u Zagrebu“*, Butorac, K. (ur.), str. 586.-612., Zagreb, 23.-24. travnja 2015., Zagreb: Visoka policijska škola MUP-a RH. (dostupno na: http://www.policija.hr/211645.aspx).
5) Kulišić, D. (2008). Indicije paleži zloporabom gorivih kapljevina, Zbornik radova „II. međunarodnog stručno-znanstvenog skupa *Zaštita na radu i zaštita zdravlja*“ (24. 09. - 27. 09. 2008., Bjelolasica), str. 405.-409.

Compulsory for English speaking students:

1) NFPA (2014). *NFPA 921: Guide for Fire and Explosion Investigations*, National Fire Protection Association, Inc. (NFPA), Quincy (MA).
2) Redsicker, D.R. (1997). *Practical Fire and Arson Investigation*, 2nd Ed., CRC Press, Boca Raton (FL).
3) Lentini, J.J. (2006). *Scientific Protocols for Fire Investigation*, CRC Press, Boca Raton (FL).
4) DeHaan, J.D. (2007). *Kirk's Fire Investigation*, 6th Ed., Pearson Prentice-Hall, Inc., Upper Saddle River (NJ).
5) TWG FASI (June 2000). *Fire and Arson Scene Evidence: A Guide for Public Safety Personnel* (*NIJ Research Report*), U.S. Department of Justice, Technical Working Group on Fire/Arson Scene Investigation (TWG FASI), Rockville (MD).
6) Bouquard, T.J. (2004). *Arson investigation: The Step-by-Step Procedure*, 2nd Ed., Charles C. Thomas Publisher, Ltd., Springfield (IL).
7) Swab, S.E. (1983). *Incendiary Fires: A Reference Manual for Fire Investigators*, Robert J. Brady Co. / Prentice-Hall Publishing and Communications Co., Bowie (MD).
8) Kästle, H. (1992). *Brandstiftung Erkennen, Aufklären, Verhüten*, Richard Boorberg Verlag GmbH & Co., Stuttgart.

FEMA/USFA (January 1993). *Basic Tools and Resources for Fire Investigators: A Handbook* (FA-127, U.S. Fire Administration/USFA), Federal Emergency Management Agency (FEMA), Washington (DC).

VELEUČILIŠTE U KARLOVCU
Karlovac University of Applied Sciences

COURSE SYLLABUS

General information

Course title:	**Quality Control**
ISVU course code:	38465, 171404, 171333
Course instructor:	Lidija Jakšić, mag.ing.cheming., lecturer
Course assistant:	
Study programme and specialization in which the course is taught:	Professional graduate study programme with master thesis
ECTS credits:	6.0
Semester of the course execution:	III
Exam prerequisites:	
Course objectives:	The aim of the course is to familiarize students with the establishment, development and application of quality system and quality control, as well with the basics in the area of quality control of the environment, and with parameters related to the quality of air, water and soils.

Course structure

Teaching mode	Number of contact hours per semester:	Student's requirements per teaching mode
Lectures:	30	attendence 60%
Exercises (auditory, linguistics):		
Exercises (laboratory, practical):	45	attendance 100%
Field work:		
Other:		
TOTAL:	75	

Monitoring of students' work and knowledge evaluation during the course

OUTCOMES		Partial exam 1	Partial exam 2	Oral	Pratical work	Total	Pass	Time frame for the recognition of the outcome
Outcome 1	O1: Define key quality and quality control concepts.	10		6		16	8	During the academic year
Outcome 2	O2: Explain the concepts and definitions of air, water and soil and regulate man's behavior through the Environmental Protection Act	10		6		16	8	During the academic year
Outcome 3	O3: Explain protection against environmental pollution by analyzing air, water and soil	10		5	5	20	10	During the academic year
Outcome 4	O4: Understand the role of statistical methods		10	6		16	8	During the academic year

	in the quality control system and know how to apply the appropriate method							
Outcome 5	O5: Evaluate the cost-effectiveness of quality control		10	6		16	8	During the academic year
Outcome 6	O6: Organize the implementation of product quality control and quality control in the industry		10	6		16	8	During the academic year
Total % grade points		30	30	35	5	100	50	
Share in ECTS		1,8	1,8	2,1	0,3	6,0		

Knowledge evaluation on exams

Exam prerequisites	Attendance				
OUTCOMES		**Written exam**	**Oral exam**	**Total**	**Pass**
Outcome 1	O1: Define key quality and quality control concepts.	10	6	16	8
Outcome 2	O2: Explain the concepts and definitions of air, water and soil and regulate man's behavior through the Environmental Protection Act.	10	6	16	8
Outcome 3	O3: Explain protection against environmental pollution by analyzing air, water and soil	10	10	20	10
Outcome 4	O4: Understand the role of statistical methods in the quality control system and know how to apply the appropriate method	10	6	16	8
Outcome 5	O5: Evaluate the cost-effectiveness of quality control	10	6	16	8
Outcome 6	O6: Organize the implementation of product quality control and quality control in the industry	10	6	16	8
Total % of grade points		60	40	100	
Share in ECTS		3.6	2.4	6.0	

Review of units per week with associated learning outcomes

Week	**Lecture course content and learning outcomes:**	**Outcome**	**Exercises course content and learning outcomes:**	**Outcome**
1.	Introduction to the course. Quality definitions with an explanation of basic concepts. Quality system: establishing, documenting, implementing, maintaining and improving quality. Overview of Historical Development.	O1	Introduction to laboratory exercises, general instructions, laboratory protection rules.	O3
2.	Terms and definitions related to air, water, and soil.	O2	Sampling errors for testing samples.	O3

3.	Environmental Protection Act. Air Protection Act. Water Act. Agricultural Land Act. Pollution of air, soil and water by technological processes.	O2	Measurement errors and sample testing.	O3
4.	The relationship between human and environmental protection regulated by the Law.	O3	Examination of physical water quality indicators (visual color determination, determination of odor, temperature of air and water).	O2, O3
5.	Quality Management Principles. Quality system elements. External and internal quality control.	O6	Determination of chemical water quality indicators: determination of pH of the water (determination of acidity using indicators, determination of pH with pH meter).	O2, O3
6.	Input control, interoperability control, final control.	O6	Determination of chemical water quality indicators: Determination of electrical conductivity.	O2, O3
7.	Quality Control Methods.	O6	Chemical water analysis: determination of water hardness (determination of carbonate hardness, determination of calcium hardness, determination of magnesium hardness, determination of total hardness)	O2, O3
8.	Quality Costs and Quality Cost Analysis.	O5	Determination of chemical water quality indicators: determination of chloride.	O2, O3
9.	Statistical methods of qualification control.	O4	Determination of chemical water quality indicators: determination of sulfate.	O2, O3
10.	Control Diagrams. Interpretation of control charts.	O4	Determination of the amount of organic matter in water.	O2, O3
11.	Quality management system.	O6	Determination of dissolved oxygen in water.	O2, O3
12.	Ensuring quality of production process. Ensuring the quality of the measurement process.	O4	Determination of CO_2 in water, alkalinity.	O2, O3
13.	Applying seven basic quality improvement tools. Quality Improvement: Diagram-Cause Effect, Paret Diagram, Dispersion Diagram.	O4	Determination of nitrite, nitrite and ammonia in water. Qualitative demonstration of carbonate in soil. Determination of pH of soil.	O2, O3
14.	Identify the use of other tools and methods to improve quality.	O5, O6	Processing of the results by statistical methods analysis.	O4
15.	Standards and standardization.	O6	Interpretation of test results using control charts.	O4

References (compulsory / additional)

1. Z. Jurac, Otpadne vode, Veleučilište u Karlovcu, 2009
2. Z. Jurac, Kemijske i biološke opasnosti, Veleučilište u Karlovcu, 2010.
3. N. Popović, I. Čupor, Tehnologija zaštite okoliša, Priručnik za vježbe, Veleučilište u Karlovcu, 2011
4. J.M.Juran, Juran's Quality Handbook, McGraw-Hill, 1999