Course Specification

(Postgraduate Programs)

Course Title:	**Introduction in Forensic Chemistry**
Course Code:	**CHM 6151**
Program:	**Executive Master of Forensic Science**
Department:	**Biology and Chemistry**
College:	**Science**
Institution:	**Imam Mohammad Ibn Saud Islamic University**
Version:	**1**
Last Revision Date:	**2 October 2024**

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A. General information about the course:

1. Course Identification:

1. Credit hours:					
3 (2 Lectures, 0 Lab, 2 Tutorials)					
2. Course type					
A.	☐University	☐College	☒ Program	☐Track	
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (1/1)					
4. Course General Description:					
Emphasize the importance of chemical knowledge in understanding of forensic examinations leading to criminal prosecutions. Introduce those aspects of chemistry and analytical chemistry relevant to crime detection. Familiarize the student with the principles must be demonstrated retrospectively.					
5. Pre-requirements for this course (if any):					
None					
6. Pre-requirements for this course (if any):					
None					
7. Course Main Objective(s):					
At the end of the course, the students will be able to: • Outline the analysis of evidence and the presentation of results. • Give an account of the variety of applications of chemistry in the field of forensic chemistry. • Familiarity with the type of chemical "signatures" that can link a suspect with a crime. • Interpret data from the chemical and physical evidence and measurements. • Manipulate and evaluate data. • Plan and organize work within published deadlines. • Design a scheme and technique (s) to solve unknown crimes.					

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning	0	0%
3	Hybrid • Traditional classroom • E-learning	0	0%
4	Distance learning	0	0%

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	**30**
2.	**Laboratory/Studio**	**0**
3.	**Field**	**0**
4.	**Tutorial**	**30**
5.	**Others (specify)……**	**0**
	Total	**60**

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**To recall Forensic Chemistry and relevant Topics.**	**K1**	▪ Three hours/week lectures. ▪ Self-study ▪ Home-exam.	▪ Regular Exams ▪ Assignments ▪ Short Quizzes ▪ Oral Discussion ▪ Participation.
1.2	**To recognize the Chemistry of Textiles, Paint and coatings relevant to Forensic Chemistry.**	**K1; K2**	▪ Three hours/week lectures. ▪ Think, and justify Textiles, Paint and coatings relevant to Forensic Chemistry relation, using available references (SDL) online. ▪ Open discussion.	▪ Oral Discussion marks ▪ Literatures Survey ▪ Mini-seminar. ▪ Participation.
1.3	**To outline reasonable appropriate arguments and interpretations for Chemical analysis for**	**K2; K4**	▪Three hours/week lectures. ▪Group Discussion using available references (SDL)	▪ Midterm. ▪ Assignments. ▪ Group Discussions. ▪ Literatures Survey

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	the scientific examination of questioned documents.			▪ Mini-seminar. ▪ Participation.
1.4	**To list the Glass analysis, Fiber Investigation, and Explosions Examinations to answer the Forensic Chemistry questions.**	**K1; K2; K3**	▪Three hours/week lectures. ▪Group Discussion using available references (SDL)	▪ Assignments ▪ Open Discussions. ▪ Literatures Survey ▪ Mini-seminar. ▪ Participation.
2.0	**Skills**			
2.1	**To Compare different Analytical Methods for the scientific examination of questioned documents.**	**S1; S4**	▪Lectures activity. ▪Practice some examples of Analytical Methods. ▪Self-study.	▪ Questions in Lectures. ▪ Short Quizzes and Exams. ▪ Open Discussions. ▪ Participation ▪ Mini - seminar.
2.2	**To justify the appropriate Forensic examination techniques for Textiles, Paint and Coatings.**	**S1; S2; S4**	▪ Lectures and Oral Discussions. ▪ Brainstorming. Self-study	▪ Questions in Lectures. ▪ Participation ▪ Oral Discussion ▪ Short Quizzes and Exams.
2.3	**To summarize the analysis and interpretation results in Forensic Chemistry questions.**	**S2; S3**	▪ Lectures ▪ Group Discussions. ▪ Brainstorming. ▪ Self-study	▪ Questions in Lectures. ▪ Short Quizzes and Exams. ▪ Participation
2.4	**To demonstrate Oral Communication for Chemical Analytical procedures and answering Forensic Chemistry questions, applied techniques, and Instruments, accompanying**	**S4; V1**	▪ Group Discussion and Assignments ▪ Introduce several examples of Forensic Chemistry question asking to analyze, which will require	▪ Oral Discussion, Quizzes, and Exams. ▪ Giving marks for Oral Discussion in Lectures. ▪ Marks given

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	writing of mini-reports, operating electronic mail, and networking in communicating with others.		reading, writing, and oral presentation. ▪ Encourage students to use electronic mail to submit Home Exams and Assignments.	for Assignments
3.0	**Values, autonomy, and responsibility**			
3.1	**To perform a scientific presentation, research, and work independently and integrate with a collaborated group, Using IT to acquire, analyze, and communicate information.**	**V1**	▪ Brainstorming. ▪ Exercises ▪ Group Discussion. Team work.	▪ Oral Discussion. ▪ Group Discussion ▪ Assignments
3.2	**To appraise effectively the collaboration and inter-professionalism in class discussions or team works, as well as independently.**	**V1; V2**	▪ Small Group tasks ▪ Open discussion at classroom. ▪ Office hour guiding. ▪ Group Presentation of mini-projects	▪ Participation ▪ Homework's ▪ Mini-project(s).

C. Course Content:

No	List of Topics	Contact Hours
1.	**Introduction**: Forensic Chemistry, Scientific Investigation, Forensic Investigation.	**4**
2.	**Textiles:** Introduction, A science of reconstruction, Textiles, Natural fibers, Manufactured fibers, Yarns and fabrics, Fiber types, Chemistry, The future.	**8**
3	**Paint and coatings examination:** Introduction, Paint chemistry, Automotive paint application, Forensic examination of paint, Paint	**4**

	evidence evaluation and expert opinion.	
4	**Chemical analysis for the scientific examination of questioned documents:** Static approach, Dynamic approach, Ink composition, Examinations, Questioned documents, crime scenes and evidential considerations, Interpreting results and rendering conclusions.	**8**
5	**Glass Analysis:** Physical properties, composition of glass, Techniques for identification of glass.	**12**
6	**Fire Investigation:** Introduction, The Nature of Fire, Factors Affecting Flame Propagation, The Investigation, Location of Point of Ignition, Excavation, Laboratory Examination, Quality Management	**12**
7	**Explosions:** Introduction, Explosives Technology, Facilities Required for Forensic Explosives Examinations, Forensic Questions, Photography, Links with other Forensic Disciplines	**12**
Total		**60**

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	**Class Activities (Open Discussion, Mini-reports, Oral Presentation, solving questions)**	**During the semester**	**30 %**
2.	**Midterm Exam**	**8th week**	**30 %**
3.	**Final Exam**	**16th week**	**40 %**
	Total		**100%**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	**Quantitative Chemical Analysis, D**. C. Harris, (8th Ed.), W. H. Freeman & Co., New York, 2010, ISBN: 9781429218153**.**
Supportive References	• **Crime Scence to Court, the essentials of Forensic Science,** Royal Society of Chemistry, 4th Ed. 1998, 978-1-78262-446-2 • **Basic Principles of Forensic Chemistry**" JaVed I. Khan, Donnell R. Christian, Thomas J. Kennedy, Springer New York Dordrecht Heidelberg London, ISBN 978-1-934115-06-0, 2012 • **Forensic chemistry Fundamental and Applications**" Jay A. Siegel, John Wiley & Sons, Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK, 2016, ISBN 978-1-118-89772-0

Electronic Materials	**None**
Other Learning Materials	• Blackboard • Multimedia associated with the text book and the relevant websites

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Each classroom should be equipped with a whiteboard and a projector, with a maximum of 20 students.**
Technology equipment (Projector, smart board, software)	**The rooms have a data show, Smart Board, and WI-FI access.**
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	**Direct:** Questionnaire.
	Course Responsible	**Direct:** Course e-Portfolio. **Indirect:** Second examiner checklist-Course report.
	Peer Reviewer	**Direct:** Questionnaire. **Indirect:** External assessor report.
Effectiveness of students' assessment	Program Leaders	**Direct:** Course e-Portfolio. **Indirect:** Course report.
Quality of learning resources	Students	**Indirect:** Second examiner checklist-Course report.
	Faculty (Academic Advisory - **FEGC**)	**Direct:** course Entrance/Exit. **Indirect:** Observations - Accreditation review.
	Program Leaders	**Direct:** Course e-Portfolio. **Indirect:** Course evaluation survey- Observations- Syllabus review- Accreditation review.

Assessment Areas/Issues	Assessor	Assessment Methods
	Students	**Indirect:** Second examiner checklist-Course report.
The extent to which CLOs have been achieved	Course Responsible	**Direct:** Exams - Course e-Portfolio. **Indirect:** Second examiner checklist-Course report.
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	**Department of Chemistry Council**
REFERENCE NO.	**7 (NO. 2/3)**
DATE	**29/3/1446 - 2/10/2024**