



اسم المقرر : الأدلة الجنائية الكيميائية وتحليل الدليل الفيزيائي
رقم المقرر : 0420-305
متطلبات المقرر : (0420-201+ 0420-259)
وحدات المقرر : 4 وحدات (3-3-4)

الوصف المختصر للمقرر:

المقرر يقدم الأسس النظرية والتطبيق المختبرى بالاجهزة للتحليل الكيميائي للادلة الجنائية المختلفة مثل المواد المسرعة للحريق والمتفجرات والطلاء والاقمشة والزجاج وغيرها. يتضمن المقرر أيضا طرق اخذ العينات من مسرح الجريمة وتجارب مختبرية باستخدام اجهزة الميكروسكوب الإلكتروني وكروماتوجرافيا الغاز وتقنيات الفصل الكروماتوجرافيا المختلفة.



COURSE DESCRIPTION FORM

Program: Minor-Forensic Science

COURSE DESCRIPTION

Course Title: Forensic Chemistry and Analysis of Physical Evidence

Course Number: 0420-305

Course Level: ☒ Undergraduate ☐ Postgraduate

Course Type: ☐ University Requirements ☒ Department Requirements

☐ Major Compulsory ☐ Major Elective

☒ Minor Compulsory ☐ Minor Elective

Credit Hours: ☐ 1 credit ☐ 2 credits ☐ 3 credits ☒ 4 credits

Lecture Hours per Week: ☐ none ☐ 1 hour ☐ 2 hours ☒ 3 hours

Lab Hours per Week: ☐ none ☐ 2 hours ☒ 3 hours ☐ 6 hours

Tutorial Hours per Week: ☐ none ☐ 1 hour ☐ 2 hours

Prerequisites:

1. 0420-201
2. 0420-259

Recommended Textbook(s):

1. Bell S. 2006. Forensic Chemistry. Latest Edition, Pearson Prentice Hall, New Jersey, USA.

Reference Book(s): (Author(s). Year. Title. Edt. Publisher. Place of publication)

1. White, P.C. (Ed.). "Crime Scene to Court, The Essential of Forensic Science" Latest Edition, R.S.C., UK.
2. Newton, D. E. "Forensic Chemistry", Latest Edition, Checkmark books, USA.



Catalogue Brief Description:

The basic concepts of the classical and simple instrumental methods of analysis and their applications.

Course Topics:

1. Overview of forensic chemistry.
2. Sampling.
3. Sample preparation, thin-layer chromatography and immunoassay.
4. Instrumentation.
5. Forensic drugs' chemistry.
6. Chemistry of combustion and arson.
7. Chemistry of colour, colorant, inks and paints.
8. Chemistry of polymer.
9. Chemistry of explosives.
10. Dealing with unknown chemicals.



Course Content:

- | | |
|--|-----------|
| 1. Overview of forensic chemistry | [1 hours] |
| 2. Sampling
Data quality, calibration, statistics and quality control. | [4 hours] |
| 3. Sample preparation
Sample preparation, thin-layer chromatography and immunoassay. | [3 hours] |
| 4. Instrumentation | [4 hours] |
| 5. Chemistry of drugs | [4 hours] |
| 6. Chemistry of combustion and arson | [4 hours] |
| 7. Colours and paints
Colours and paints, colorant, inks and paints | [4 hours] |
| 8. Forensic chemistry of polymers
Polymers, papers, fibres and glass | [4 hours] |
| 9. Chemistry of explosives | [3 hours] |
| 10. Dealing with unknown chemicals | [2 hours] |

Lecture Hours [33 hours]

Midterm Exams [2 hours]

Total Hours [35 hours]



Practical Topics (Laboratory):

1. Footprints and finger prints 1
2. Footprints and finger prints 2
3. Spot test of seized drugs
4. Microcrystal test of seized drugs.
5. FTIR, uv, and GC of seized drugs.
6. Document and trace: Inks by TLC.
7. Documents and trace: Fibers.
8. Documents and trace: Glass.
9. Explosives: Low Explosive 1.
10. Explosives: Low Explosive 2.
11. Arson 1.
12. Arson 2.

PRACTICAL ASSESSMENT METHODS & GRADING

- Check all forms of assessments that may be used for the practical.

☒ Lab reports	15	%
☒ Lab. Work	5	%
☐ Fieldwork	---	%
☐ Other	---	%
☒ Term Exams	10	%
☒ Final Exam	10	%
Total	40	%



ASSESSMENT METHODS & GRADING

- Check all forms of assessments that may be used for this course.

☒ Term Exams	15 %
☒ Quizzes	5 %
☒ Homework/Assignments	5 %
☐ Computer Assignments	%
☒ Term Paper/Projects	5 %
☐ Oral Presentation	%
☐ Poster Presentation	%
☒ Lab. Work	40 %
☐ Fieldwork	%
☐ Class Participation/Activity	%
☐ Other	%
☒ Final Exam	30 %
Total	100 %



COURSE LEARNING OUTCOMES

By the end of this course, students will be able to:

- ❶ Write about forensic chemistry relevant to physical evidences.
- ❷ Apply proper sampling technique to collect physical evidence from crime scene.
- ❸ Separate the components of a forensic sample.
- ❹ Characterize samples of polymers, papers, fibers ...etc by instrumental analysis.
- ❺ Discuss the chemistry of combustion and arson.
- ❻ Explain the chemistry of colorant, inks, paints, and explosives.
- ❼ Analyze unknown chemicals.

Relevance Rate to the Course Learning Outcomes

Course Learning Outcomes	Example(s) of Relevant Topics/Activities	Relevance Rate
❶	Detection of blood stain.	L
❷	Sampling of fiber tissues	
❸	Application of chromatography to separation of ink sample	M
❹	Applying atomic absorption to analysis of metal ions	L
❺	Analysis of combustion remains	M
❻	Analysis of colorant by spectrophotometry	H
❼	Analysis of water sample	H



PROGRAM LEARNING OUTCOMES

Using the labels H, M, or L, rate the relevance of each **Course Learning Outcome** in the learning outcome matrix below to the **Program Learning Outcomes** where applicable. (A summary of the Program Learning Outcomes is provided in a separate document).

		COURSE LEARNING OUTCOMES					
		①	②	③	④	⑤	⑥
PROGRAM LEARNING OUTCOMES	1. Describe and discuss basic scientific principles that are applied in Forensic Biology and/or Forensic Chemistry	H					
	2. Perform different analytical techniques used in Forensic Biology and/or Forensic Chemistry.		M	L			H
	3. Conduct Forensic experiments, analyze, interpret and report results in scientific manner as part of his/her job in Governmental or private sector.			H	M		
	4. Link effectively scientific analyses of material and evidences with the enforcement of law and justice.		L		L	M	
	5. Pursue graduate studies in Biological or Chemical Forensics Sciences.	L		M			H



Course Coordinator: Dr. Ali Bu-Magdad & Prof. Dr. Adel F. Shoukry

Academic Rank: Assistant Professor -- Professor

Program: Dept. Chemistry

Date: 1/10/2010