

CHEM2808: FORENSICS AND MODERN SOCIETY

Effective Term

Semester A 2022/23

Part I Course Overview

Course Title

Forensics and Modern Society

Subject Code

CHEM - Chemistry

Course Number

2808

Academic Unit

Chemistry (CHEM)

College/School

College of Science (SI)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

BCH2808 Forensics and Modern Society

Exclusive Courses

GE2334 Science Versus Crime

CHEM2809/BCH2809 Science Versus Crime

Part II Course Details

Abstract

The course is collaboratively taught by four instructors from four departments of the College of Science and Engineering:

Chemistry

Crime scene investigation techniques, Criminalistics, Controlled drugs, explosives & bombs

Computer Science

Digital forensics

Physics & Materials Science

Forensic engineering, machinery failure, expert witness and cross-examination in court

All the instructors involved are experienced in their own disciplines of Forensic Sciences.

Teaching is mainly done via formal lectures (2 hr every week). This is supplemented by invited guest lectures (e.g. on computer forensics) and interactive tutorials (e.g. on crime scene walkthrough & investigation and blood alcohol & breathalyzer test). These tutorials are arranged to allow students to learn, and discover by themselves, specific skills in forensics caseworks, and to put them in practical uses. For example, in the crime scene walkthrough tutorials, mock break-in, burglary and/or vandalism crime scenes are set up so that students can learn about all the important tactics and skills in CSIs.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Evaluate basic crime scene techniques. Explain the importance of logical thinking and ability to apply this to different forensic scenarios. Apply forensics and crime scene techniques in crime scene investigations.	45	x	x	x
2	Describe how the use and misuse of computers has led to the need for more professionals who can detect and combat computer crime.	24	x		
3	Explain the importance of timely and accurate forensic engineering investigation on incidents such as the collapse of tower cranes.	12	x		
4	Describe the role of the forensic engineer in engineering litigation involving financial loss or criminal prosecutions.	11	x		
5	Describe the role of forensic expert witness in Court.	8	x		

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

TLAs	Brief Description	CILO No.	Hours/week (if applicable)	
1	Lectures	Formal lectures (including guest lectures from experts in specific fields of forensic investigations)	1, 2, 3, 4, 5	26 hrs
2	Mock crime scene investigation and CSI report writing	Mock crime scene investigation and CSI report writing	1	6 hrs
3	Tutorials	Tutorials on drug and alcoholic abuse	1	1 hr
4	Case studies	Case studies on relevant major forensic cases	1, 2, 3, 4	2 hrs
5	Multimedia teaching and learning	Multimedia teaching and learning (using materials from TV programmes, newspaper and the internet) of relevant topics in criminalistics, digital forensics and forensic engineering	1, 2, 3, 4	2 hrs
6	Multimedia teaching and learning	Multimedia teaching and learning (using materials from TV programmes, newspaper and the internet) of roles of forensic expert witness and cross-examination skills and tactics in Court	5	2 hrs

Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)	
1	Crime scene investigation report	1	38	
2	Essay writing on topics about drug abuse	1	8	
3	Application of pharmacokinetic model to estimate alcohol contents in blood and breathe	1	8	
4	Short quiz and report writing on digital forensics topics	2	23	
5	Essay and report writing on forensic engineering topics and cases	3, 4	23	

Continuous Assessment (%)

100

Examination (%)

0

Additional Information for ATs

Starting from Semester A, 2015-16, students must satisfy the following minimum passing requirement for courses offered by CHEM:

“A minimum of 40% in both coursework and examination components.”

Assessment Rubrics (AR)

Assessment Task

Crime scene investigation report

Criterion

Capability in: (a) applying proper crime scene investigation (CIS) procedures and techniques to investigate a mock crime scene, (b) proper identification of trace evidences, and (c) presentation of investigation results in an orderly fashion.

Excellent (A+, A, A-)

Able to provide a comprehensive analysis of the trace evidences at the mock crime scene, with clear explanations, logical and advanced justifications.

Able to show evidence in arguments or applications of the use of a range of sources of information outside taught material, properly referenced, with effective written communication.

Good (B+, B, B-)

Able to provide detail and critical analysis of the trace evidences at the mock crime scene, with accurate and clear explanations.

Able to show an ability to integrate concepts, analytical techniques and applications via clear written communication.

Fair (C+, C, C-)

Able to provide some simple analysis of the trace evidences at the mock crime scene.

Able to show evidence of the clear use of written communication.

Marginal (D)

Only able to demonstrate limited ability in analysis and justification of the trace evidences at the mock crime scene, with a lack of an integrated understanding of applications in forensic procedures as a whole.

Able to communicate simple ideas accurately in writing.

Failure (F)

Cannot provide appropriate analysis and satisfactory justifications to the trace evidences at the mock crime scene.

May show evidence of plagiarism or inability to communicate ideas, or a bare minimum of effort.

Assessment Task

Essay writing on topics about drug abuse

Criterion

Demonstration of understanding of: (a) the scientific and social definitions of drug abuse, (b) the controversies in the social and cultural acceptance of the use and abuse of certain drugs, (c) physiological and psychiatric impact of dangerous drugs and substances, and (d) update information of emerging drugs of abuse.

Excellent (A+, A, A-)

Able to provide a comprehensive analysis on the various aspects of drug abuse, with clear explanations, logical and advanced justifications.

Able to show evidence in arguments or applications of the use of a range of sources of information outside taught material, properly referenced, with effective written communication.

Good (B+, B, B-)

Able to provide detail and critical analysis on the various aspects of drug abuse, with accurate and clear explanations.

Able to show an ability to integrate concepts, analytical techniques and applications via clear written communication.

Fair (C+, C, C-)

Able to provide some simple analysis on selected aspects of drug abuse.

Able to show evidence of the clear use of written communication.

Marginal (D)

Only able to demonstrate limited ability in analysis on some selected aspects of drug abuse, without strong evidence of an integrated understanding on the topic.

Able to communicate simple ideas accurately in writing.

Failure (F)

Cannot provide appropriate analysis on any aspects of drug abuse.

May show evidence of plagiarism or inability to communicate ideas, or a bare minimum of effort.

Assessment Task

Application of pharmacokinetic model to estimate alcohol contents in blood and breathe

Criterion

Capability in applying simple pharmacokinetic models to estimate blood alcohol content after alcohol consumption.

Excellent (A+, A, A-)

Able to demonstrate clear understanding of the pharmacokinetic models and how they can be applied in various situations and scenarios.

Good (B+, B, B-)

Able to apply the pharmacokinetic models under various situations and scenarios.

Fair (C+, C, C-)

Able to apply the pharmacokinetic models under some simple situations and scenarios.

Marginal (D)

Only able to use the pharmacokinetic models under supervision.

Failure (F)

Cannot demonstrate any understanding of the basic concepts of the pharmacokinetic models.

May show evidence of plagiarism.

Assessment Task

Short quiz and report writing on digital forensics topics

Criterion

Demonstration of: (a) understanding the basic principles in selected digital forensic topics, and (b) capability to apply techniques used in digital forensic analysis.

Excellent (A+, A, A-)

Able to demonstrate excellent understanding of the digital forensic topics.

Good (B+, B, B-)

Able to describe and explain forensic principles of the digital forensic topics.

Fair (C+, C, C-)

Able to describe and explain some key forensic principles, applications, processes and methodologies related to the digital forensic topics.

Marginal (D)

Able to briefly describe isolated principles, applications, methodologies, problems and limitations related to the digital forensic topics.

Failure (F)

Fail to accurately describe and explain relevant principles, applications, processes, methodologies, problems and limitations related to the digital forensic topics.

Assessment Task

Essay and report writing on forensic engineering topics and cases

Criterion

Demonstration of: (a) understanding the basic principles in selected forensic engineering topics, and (b) capability to apply techniques used in forensic engineering investigations.

Excellent (A+, A, A-)

Able to provide a comprehensive analysis of real-life cases in forensic engineering, with clear explanations, logical and advanced justifications.

Able to show evidence in arguments or applications of the use of a range of sources of information outside taught material, properly referenced, with effective written communication.

Good (B+, B, B-)

Able to provide detail and critical analysis of real-life cases in forensic engineering, with accurate and clear explanations.

Able to show an ability to integrate concepts, analytical techniques and applications via clear written communication.

Fair (C+, C, C-)

Able to provide some simple analysis of real-life cases in forensic engineering.

Able to show evidence of the clear use of written communication.

Marginal (D)

Only able to demonstrate limited ability in analysis and justification of real-life applications in forensic engineering, with a lack of an integrated understanding of applications in forensic procedures as a whole.

Able to communicate simple ideas accurately in writing.

Failure (F)

Cannot provide appropriate analysis and satisfactory justifications to real-life cases in forensic engineering.

May show evidence of plagiarism or inability to communicate ideas, or a bare minimum of effort.

Part III Other Information

Keyword Syllabus

Forensic(s); Crime scene; CSI, Chain-of-custody; Contamination; Pollution; Environment; Explosives; Counterterrorism; Intellectual Property; Counterfeit; Narcotics; Drugs; Fraud; Currency; Documents; Accuracy; Globalisation; Court; Engineering; Ethics; Honesty; Dishonesty; Computers: Pornography; Prosecution; Defence; Law; Lawyers; Criminal; Civil; Identification; Identity; Analysis; DNA; Odontology; Presumptive tests, Matching; Certainty.

Reading List

Compulsory Readings

Title	
1	Nil

Additional Readings

Title	
1	Forensic Science: Andrew R.W. Jackson and Julie M. Jackson, (2007 – 2nd edition) Prentice Hall.
2	Forensic Science – An Introduction to Scientific and Investigative Techniques: Stuart H. James and Jon J. Norby (2005 – 2nd edition), Taylor and Francis.
3	Computer Forensics: An Essential Guide for Accountants, Lawyers and Managers: Michael Sheetz, John Wiley.
4	The Winning Line: A Forensic Engineer' s Casebook: Andrew Samuel, Springer-Verlag, London, 2007.
5	FORENSICnetBase: ~150 entire books covering many different forensic sub-fields, available online. City University is the only university in Hong Kong with this excellent facility that is continually updated as new books are added to the scheme.