

**City University of Hong Kong
Course Syllabus**

**offered by Department of Systems Engineering and Engineering Management
with effect from Semester A 2017/18**

Part I Course Overview

Course Title: Quality Management for Laboratory Operations

Course Code: SEEM3068

Course Duration: One Semester

Credit Units: 3

Level: B3

- Arts and Humanities
 Study of Societies, Social and Business Organisations
 Science and Technology

Proposed Area:
(for GE courses only)

Medium of Instruction: English

Medium of Assessment: English

Prerequisites:
(Course Code and Title) Nil

Precursors:
(Course Code and Title) MA2172 Applied Statistics for Sciences and Engineering and
BCH2801 Characterization and analysis of Chemical Hazards I

Equivalent Courses:
(Course Code and Title) MEEM3068 Quality Management for Laboratory Operations

Exclusive Courses:
(Course Code and Title) Nil

Part II Course Details

1. Abstract

(A 150-word description about the course)

This training course provides essential knowledge in managing quality related issues in laboratory operations. This course is purposely designed to introduce contemporary concepts and knowledge in laboratory quality management such as measurement, calibration and audit practice of laboratory operations. Upon the completion of this course, participants should be equipped with basic concepts, knowledge and tools that are expected to be applied by Quality Officers/Engineer/Laboratory Professionals working in laboratories or testing centres.

This course covers the main body of knowledge of the Certified Laboratory Quality Specialist (CLabQS) of Hong Kong Society for Quality (HKSQ).

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs [#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Describe the basic concept of quality management in laboratory operations environment, including ISO 17025 and ISO 9001	10%			
2.	Elaborate and apply principles of managerial and technical requirements of quality management in laboratory operations and audit skill in the laboratory environment	20%			
3.	Identify and outline appropriate calibration methods and measurement uncertainties in different type of testing equipment employed in laboratory	30%	√	√	
4.	Understanding the commercial laboratory environment, requirements and practice through the study of HOKLAS and SOP requirements	20%			
5.	Describe and audit the requirements and implementations of laboratory integrated management system included quality, health, safety, environmental and security.	20%	√		
		100%			

* If weighting is assigned to CILOs, they should add up to 100%.

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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 self-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.

3. Teaching and Learning Activities (TLAs)
(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4	5	
Large Class Activities	Learning through teaching is primarily based on lectures. Group discussion will be used to facilitate conceptual understanding of the various management system requirement.	√	√	√	√	√	20 hours/semester
Laboratory Works and Report	The team-based laboratory exercises provide students with the opportunities to understand, perform and report different testing and calibration requirement, as well as, measurement uncertainty reporting.			√			9 hours/semester
Tutorial Exercises (plus site visit)	The individual exercise enables student to understand the basic requirement of different management system, calibration practice and measurement uncertainty calculation. It includes a site visit to commercial laboratory operations.	√	√	√	√	√	10 hours/semester

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: <u>50%</u>							
Tutorial Exercises		√	√	√	√	25%	
Laboratory Works and Report			√			25%	
Examination: <u>50%</u> (duration: 2 hours)							
						100%	

**The weightings should add up to 100%.*

For a student to pass the course, at least 30% of the maximum mark for the examination should be obtained.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Tutorial Exercises	The tutorial exercises assess student's ability to understand the calibration and measurement uncertainty calibration as well as audit skill. It includes the site visit report.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Laboratory Works and Report	The laboratory report assess students' ability to understand, perform and report different type of calibration and testing, as well as the usage of measurement uncertainty and detection limit.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Examination	Examination questions are designed to assess student's level of achievement of the intended learning outcomes including the understand of laboratory management system, laboratory work and measurement uncertainty, audit and quality practices.	High	Significant	Moderate	Basic	Not even reaching marginal levels

The tutorial exercises and the case study will be numerically-marked, while examination will be numerically-marked and grades-awarded accordingly. The areas of achievement to be assessed for each activity are summarized as below.

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

- Commercial laboratory practice
- ISO9001 & ISO/IEC 17025
- Management/ technical requirements for accreditation
- Calibration practice
- ISO Guide to expression of uncertainty in measurement
- EURACHEM/CITAC Guide of quantifying uncertainty in analytical measurement
- Traceability concept
- Good Manufacturing Practice (GMP) & Good Laboratory Practice (GLP)
- ISO 15189 for medical laboratory
- Quality Assurance in testing
- Standard operation procedure (SOP) for difference testing methods and Sampling technique
- Environmental management in laboratory (ISO14001)
- Safety management in laboratory (OHSAS18001)
- QMS auditor requirement
- Laboratory assessor requirements

2. Reading List

2.1. Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

Nil

2.2. Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	HKAS 002, HOKLAS 003, HOKLAS 015, HKAS Supplementary Criteria No. 5, and HOKLAS Supplementary Criteria No. 2 & 33.
2.	Donald C. Singer, "A Laboratory Quality Handbook of Best Practices and Relevant Regulations", ASQ Quality Press, 2001.