THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Completion Report
Project Supported by LTC/OBA Funding*

(Period covered: 1 May 2008 – 30 June 2010)

FCLU

2 5 JUN 2010

Part I: General Information

Funding Source (please tick ✓ as appropriate):   LTC   ✓ OBA Funding

Project Code: 2007-08/OBA/LSGI   **Host Department:** LSGI

Project Title: Alignment of the BSc (Hons) in Geomatics (Geo-IT) with HKIE and ABET criteria on outcomes-based programme accreditation

Project Team:

Project Leader (Name & Dept):	Team Member(s) (Name & Dept):
Prof Esmond Mok, LSGI	Prof Y Q Chen, LSGI
	Dr Conrad Tang, LSGI
	Dr Eric Guilbert, LSGI
	Prof Janet Nichol, LSGI
	Dr Lilian Pun, LSGI
	Prof Z L Li, LSGI
	Mr Geoffrey Shea, LSGI
	Dr Bruce King, LSGI
	Mr Steve Lam, LSGI
	Prof John W Z Shi, LSGI
	Dr H B Iz, LSGI
	Mr Nelson Chan, LSGI

Part II: Project Details

1. Financial Information

(a) Overview

Approved Funding:	Additional Funding Received (if any):	Total Funding Received:
	+	=

Source of Additional Funding: N/A

(b) Project Expenditure

† Please give reasons for the revised budget and quote the relevant authority's approval reference where appropriate

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2. Project Schedule

	Start date (dd/mm/yyyy)	Completion date (dd/mm/yyyy)
Dates as Stated in Original Proposal:	01/05/2008	30/06/2010

	Start date (dd/mm/yyyy)	Completion date (dd/mm/yyyy)
Actual Start and Completion Dates:	01/05/2008	30/06/2010

	Total no. of extension(s) obtained :	Obtained during the project period:
Project Period Extension(s) (if any):	time(s)	For a total of month(s)

Reason(s) for Extension(s) (if any):

* *LTC: Learning and Teaching Committee*
OBA Funding: Funding for Promoting Outcome-Based Approaches to Student Learning

3. Project Implementation

(a) Project objectives

1. To review the programme outcomes of the current BSc (Hons) in Geomatics (Geo-IT) with reference to the criteria set out by the Hong Kong Institution of Engineers (HKIE) and the Accreditation Board of Engineering and Technology (ABET).
2. To identify the gaps between the subject and programme levels of assessment, and to eliminate/minimise the gaps by re-designing appropriate assessment methods of subjects that can effectively reflect students' performance in the defined programme outcomes.
3. To design effective methods to measure how well the graduating students have developed in the defined programme outcomes.
4. To evaluate the effectiveness of the programme assessment method.
5. To extrapolate the outcomes into the remainder of the BSc programme.

(b) Overview of specific work undertaken for achieving the project objectives (including any changes to original proposal)

1. The programme outcomes of the current BSc (Hons) in Geo-IT had been reviewed with reference to the criteria set out by HKIE and ABET. The pre-accreditation advisory visit by the Information Engineering Discipline of HKIE was conducted in June 2008. Curriculum and subject contents were carried out in 2009 in light of the Advisory Visit Report. The revised version is now ready for submission and a meeting with HKIE's Director of Qualification has been scheduled in early July, 2010.
2. The Programme Learning Outcomes Assessment Plan (PLOAP) of BSc(Hons) in Geomatics (Geo-IT Stream) was designed taking into consideration of HKIE's comments after the advisory visit.
3. A software program has been developed to automatically generate the percentage of students that meet the threshold of the intended learning outcomes for each year of study. The percentage calculations are based on student performance in the subjects that T&L and assessment components would lead to the development of the respective PLO(s).

(c) Difficulties encountered, if any, which have affected progress, and remedial actions taken

It was difficult to recruit a personnel having experience on project management and academic curriculum development. Eventually, the same project fellow was employed under two OBA projects, and he could only spend about 50% of the time on this project.

(d) Deliverables/useful findings/good practices emerged

1. A document setting out the alignment between the programme outcomes and the criteria set by HKIE and ABET (Appendix I)
2. A subject-based self-assessment template to help teachers review and record the relationship between the subject and programme outcomes (Appendix II)
3. A set of self-assessment templates to help teachers identify the assessment methods of subjects towards the HKIE

criteria and measure how well the students have developed in these outcomes (Appendix III)

(e) Dissemination activities taken/planned to sustain impact

1. A presentation on "Outcomes-based Curriculum Design of BSc (Hons) in Geomatics" was delivered by the Project Leader in the 3-3-4 Symposium at the Hong Kong Polytechnic University on December 14, 2009.
2. A forum on LSGI's PLOAP development was held in October 2009.
3. A revised HKIE accreditation document has been completed. The document is presented with the outcomes based approach of curriculum and methods for measuring programme learning outcomes, pending comments and advice by HKIE's key members. This outcomes based accreditation document will cope with HKIE's new policy on adopting the outcomes based approach in the accreditation process by 2012.

(f) Self-evaluation or additional information/remarks

The project team has put a lot of efforts in developing the outcomes based accreditation document, in which process the teaching and learning methods, measurement of success of criteria for assessing students' achievement of intended learning outcomes at graduation, and quality assurance mechanism were developed. Subject contents and curriculum design were modified according to the comments made by the HKIE advisory visit team. It is hoped that the BSc(Hons) in Geomatics (Geo-IT) will be successfully accredited by the Information Discipline of HKIE. If successful, this programme is probably the first programme being accredited by both Hong Kong Institution of Engineers and The Hong Kong Institute of Surveyors.

Name of Project Leader: Prof Esmond Mok   Date: 23 June, 2010
                                   (in block letters)

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Part III: Evaluation by D/SLTC (or by HoD/Director of School^)

(a) Rating and comments/recommendations on the following areas of the project
(please put a ✓ in 1 of the following 2 ratings and provide comments)

Areas	Rating Satisfactory	Rating Needing attention	Comments and Recommendations
Overall financial management/ use of funding	✓		
Overall project progress	✓		
Outputs /deliverables / dissemination	✓		
Overall rating / comments on the project (Please suggest remedial actions if the rating is "Needing attention")	✓		

(b) Issues requiring the attention of FLTC/Director of School and/or the funding authority

Nil

(c) Outputs/deliverables/good practices of the project that can be shared with other subjects, programmes or departments within the Faculty, or with the wider PolyU community

Nil

(d) Additional comments/remarks

Nil

Name of D/SLTC Chair
(or HoD/Director of School): _Prof. Xiaoli Ding_   Date: 2 5 JUN 2010
(in block letters)

^ To be prepared by HoD/Director of School _If_ the PL is also the D/SLTC Chair, _or if_ the Centre/Unit/Office does not have a DLTC

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Part IV: Evaluation by FLTC/Director of School#

(a) Overall rating on the project (please put a ✓ in 1 of the following 2 ratings):

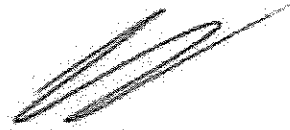☑ Satisfactory

☐ Needing attention

(b) Overall comments and recommendations on the project:

(c) Issues requiring the attention of the funding authority:

Name of FLTC Chair/
Director of School: _Prof Geoffrey Shen_ Date: _29 June 2010._
           (in block letters)

The Director of School or HoD of the Centre/Unit/Office needs not fill this part if he/she has already commented in Part III.

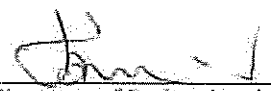## Part V: Response & Follow-up Plan by Project Leader

(Response and follow-up plan is required from the Project Leader if there is any area rated as "needing attention" in Part III and/or IV.)
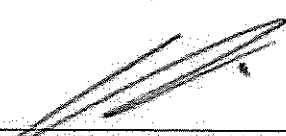
Name of Project Leader: _Prof Esmond Mok_ Date: _29/6/2010_
           (in block letters)

Signature of Project Leader   _Signature of D/SLTC (or HoD)@_   _Signature of FLTC/
                              Director of School_

Prof Esmond Mok   _Prof Xiaoli Ding_   _Prof Geoffrey Shen_
(Name in block letters)   (Name in block letters)   (Name in block letters)

@ *To be signed by HoD if the PL is also the DLTC Chair, or if the Centre/Unit/Office does not have a DLTC; leave this blank if the PL is also the SLTC Chair.*

The Project Leader and D/SLTC Secretary should each keep a copy of this *Completion Report* for records.
A copy of this *Completion Report* will be submitted along with the *F/SLTC Annual Report (Form 20)*
to LTC/WGOBE as a supporting document.

Teaching Alignment of Program Outcomes with HKIE/ABET Gereral Criteria

General Criteria	Description of Desired Outcome	Programe Outcome(s)
1	An ability to apply knowledge of mathematics, science, and engineering appropriate to the degree discipline	K1, K2, K3, K4, K5; P1, P2, P3, P4, P5;
2	An ability to design and conduct experiments, as well as to analyze and interpret data	K1, K5; P1, P2, P3, P4, P5;
3	An ability to design a system, component, or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability	K6; P1, P2, P3, P4, P5, P6;
4	An ability to function on multi-disciplinary teams	K6; P7, A2, A4;
5	An ability to identify, formulate, and solve engineering problems	K1, K4; P1, P2, P3, P4, P8, P9, P10;
6	An understanding of professional and ethical responsibility	K6; P7, P8, P9, P10; A2;
7	An ability to communicate effectively	K6, K7; P4, P5, P6, P7, P9, A1;
8	An ability to understand the impact of engineering solutions in a global and societal context, especially the importance of health, safety and environmental considerations to both workers and the general public	P13; A5;
9	An ability to recognize the need for, and to engage in life-long learning	P13;
10	An ability to stay abreast of contemporary issues	A5;
11	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice appropriate to the degree discipline	K1, K2, K3, K4, K5, K6, K7; P1, P2, P3, P4, P5, P6, P8, P9, P10, P11, P12;
12	An ability to use the computer / IT tools relevant to the discipline along with an understanding of their processes and limitations	K2, K3, K7; P1, P2, P3, P4, P6, P8, P9, P10, P11, P12, P13;
13	Others	K6, A2, A3, A4;

Relationship Between Subject Outcomes and Programme Outcomes [addressed with Introduced, Reinforced, and Assessed]

LSGI Subject Code & Title: LSGI2372: Surveying

Subject Outcomes

	A [L2]							B [L3]							C [L2]							D [L3]							E [L3]							F [L4]						
	Describe the functions and operation of modern survey equipment							Explain sources of errors in survey measurements and apply proper field procedures to reduce or eliminate these errors							Describe how a survey coordinate system is established and the conversion from one plane coordinate system to another							Compare different control and positioning techniques and their backing methods							Correctly apply the control and positioning techniques under different site conditions and specification requirements							Confidently carry out the field scheme / project according to specification						
	Curriculum			Report				Curriculum			Report				Curriculum			Report				Curriculum			Report				Curriculum			Report				Curriculum			Report		
Programme Outcomes	I	R	A	I	R	A	I	R	A	I	R	A	I	R	A	I	R	A	I	R	A	I	R	A	I	R	A	I	R	A	I	R	A	I	R	A	I	R	A

Technical Outcomes: Academic Knowledge

K1	√ or X
K2	√ or X
K3	√ or X
K4	√ or X
K5	√ or X
K6	√ or X
K7	√ or X

Technical Outcomes: Professional Knowledge and Skills

P1	√ or X
P2	√ or X
P3	√ or X
P4	√ or X
P5	√ or X
P6	√ or X
P7	√ or X
P8	√ or X
P9	√ or X
P10	√ or X
P11	√ or X
P12	√ or X
P13	√ or X

Generic Outcomes: Attributes for all-roundedness

A1	√ or X
A2	√ or X
A3	√ or X
A4	√ or X
A5	√ or X

Comments / Evaluative Comments:

Scientific & Engineering Component:
Mathematics Component:
Complementary Component:

Code	Programme Outcomes

Technical Outcomes: Academic Knowledge

Code	
K1	Engineering (Applied) Mathematics
K2	Computer Science / Information Technology
K3	Geographic Information Technology
K4	Land and Hydrogarphic Surveying
K5	Error Theory and Data Processing and Analysis
K6	Management (e.g., project management)
K7	Data Presentation and Visualization

Technical Outcomes: Professional Knowledge and Skills

Code	
P1	the ability to apply appropriate mathematical and computer knowledge to solve problems and analyze data
P2	the ability to identify and correctly apply appropriate Geomatics concepts to solve problems and analyze data relating to surveying applications
P3	the ability to identify and correctly apply appropriate Mapping and GIS concepts to solve problems and analyze data relating to Geo-IT applications
P4	the ability to develop appropriate standards and exploit their knowledge of modern surveying equipment for the designing, collecting, processing, interpreting, analyzing, integrating and managing of survey data according to a client's specification
P5	the ability to develop appropriate standards for the designing, collecting, processing, interpreting, analyzing, integrating and managing of geo-spatial data and systems according to a client's specification
P6	the ability to develop Geo-IT software and customization according to a client's specification
P7	the ability to work and supervise others in accordance with, and abide by, the legal, ethical and professional standard
P8	the ability to integrate the various technologies to solve Geomatics problems in a professional, timely and cost effective manner
P9	the ability to integrate the various technologies to solve Geo-IT problems in a professional, timely and cost effective manner
P10	the ability to integrate the various technologies to solve general IT and Geo-IT problems in a professional, timely and cost effective manner
P11	the ability to carry out and manage technical details of GIS projects, with particular emphasis on software customization and development
P12	the ability to apply technical computing knowledge in integrating Geo-IT solutions, such as GIS, with other application systems, such as Decision Support System, Workflow System or Internet-based Commercial Systems
P13	the ability to respond to and follow closely the advancement in Computing and Geo-IT technologies, staying tuned to the impact of state-of-the-art technologies in application development, with an attitude of continuous and lifelong learning

Generic Outcomes: Attributes for all-roundedness

Code	
A1	the ability to communicate affectively in English and demonstrate suitable presentation skills
A2	have cooperative (correct) attitudes and behavior of working with others
A3	the ability to think critically and creatively
A4	have developed entrepreneurship concepts and ideas
A5	global outlook

Appendix III

LSGI Subject Code & Title: _____

HKIE General Criterion 1:	An ability to apply knowledge of mathematics, science, and engineering appropriate to the degree discipline.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 2:	An ability to design and conduct experiments, as well as to analyze and interpret data.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 3:	An ability to design a system, component, or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 4:	An ability to function on multi-disciplinary teams.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 5:	An ability to identify, formulate, and solve engineering problems.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 6:	An understanding of professional and ethical responsibility.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 7:	An ability to communicate effectively.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____
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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____
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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____
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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____
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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____
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LSGI Subject Code & Title: _____

HKIE General Criterion 8:	An ability to understand the impact of engineering solutions in a global and societal context, especially the importance of health, safety and environmental considerations to both workers and the general public.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion?   _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 9:	An ability to recognise the need for, and to engage in life-long learning.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 10:	An ability to stay abreast of contemporary issues.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 11:	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice appropriate to the degree discipline.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 12:	An ability to use the computer / IT tools relevant to the discipline along with an understanding of their processes and limitations.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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LSGI Subject Code & Title: _____

HKIE General Criterion 13:	Others.

Assessment Component 1: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 2: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 3: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 4: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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Assessment Component 5: _____

How many students, by percent, have achieved the above criterion? _____ %

Reflective Comments: _____

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