Subject Description Form

Subject Code	LSGI2961
Subject Title	Engineering Surveying
Credit Value	3
Level	2
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	Provide students with elementary concept and practice of modern surveying instruments and methods, and their applications for construction projects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: Category A - Professional/academic knowledge and skills a. Able to master the elementary concept and methods of engineering surveying. b. Able to operate basic and modern surveying instruments. c. Able to collect, analyse and report basic survey data for the design and construction of civil and building infrastructures. Category B - Attributes for all-roundedness d. Students' communication skill and cooperative attitudes of work with others will be developed through group field practical.
Subject Synopsis/ Indicative Syllabus	**Syllabus Content:** *Fundamentals of Surveying* Geomatics and surveying. Survey reference systems. Measurement errors. *Distance Measurements* Tape measurement and corrections. Offset surveying by taping. Electromagnetic distance measurement and corrections. *Angular Measurements* Optical and electronic digital theodolites. Basic features of a typical theodolite. Operation, observation procedures and data reduction. *Height Measurements* Optical and digital levelling instruments. Basic features of a typical levelling instrument. Operation, observation procedures, and data reduction. *Position Determination* Height determination: ordinary and trigonometric levelling. Horizontal position determination*:* radiation and resection methods. *Satellite Surveying* Concept of satellite surveying. 3-D position determination by Global Navigation Satellite Systems (GNSS).

	Horizontal and Vertical Control Surveys Concept of control survey. Specifications. Monumentation. Traverse computation, quality check and adjustment. Height control establishment by ordinary levelling, quality check and adjustment. Establishment of horizontal and vertical controls by GPS. *Detail Survey* Detail surveying using modern survey instruments and GNSS. *Engineering Surveying* Road alignments: Horizontal alignment: straight, circular, transition curves. Vertical alignment: Parabolic curve. Super-elevation in road/railway design. Area and cross sections. Earthwork volume computation. Setting out.
Teaching/Learning Methodology	Teaching and learning will be basically lectures and reinforced by tutorials and field practical. In order to consolidate students learning, in-class exercise will be given in tutorials. Group discussion is encouraged for the possible solutions to the in-class exercise, followed by the concluding session at the end of the tutorial.
Assessment Methods in Alignment with Intended Learning Outcomes	See table below. Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: The coursework assessments include a practical test and a mini project to reinforce the concepts taught in lectures.

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d		
1. Examination	60%	√	√	√			
2. Coursework	40%	√	√	√	√		
Pass both components	Yes						
Total	100 %						

Student Study Effort Expected	Class contact:	
	▪ Lecture (2 Hrs per session)	26 Hrs.
	▪ Practical work (3 Hrs in Weeks 4-9; 6 Hrs in Weeks 10-13)	42 Hrs.
	Other student study effort:	
	▪ Self-study and practical on equipment operation	64 Hrs.
	Total student study effort	132 Hrs.

Reading List and References	**Recommended:** Schofield, W. (2007). *Engineering Surveying*, 6th ed. Butterworth-Heinemann. Uren, J. and Price, W. F. (2006). *Surveying for Engineers*, 4th ed. Palgrave Macmillan

Note 1: Intended Learning Outcomes
Intended learning outcomes should state what students should be able to do or attain upon completion of the subject. Subject outcomes are expected to contribute to the attainment of the overall programme outcomes.

Note 2: Subject Synopsis/ Indicative Syllabus
The syllabus should adequately address the intended learning outcomes. At the same time over-crowding of the syllabus should be avoided.

Note 3: Teaching/Learning Methodology
This section should include a brief description of the teaching and learning methods to be employed to facilitate learning, and a justification of how the methods are aligned with the intended learning outcomes of the subject.

Note 4: Assessment Method
This section should include the assessment method(s) to be used and its relative weighting, and indicate which of the subject intended learning outcomes that each method purports to assess. It should also provide a brief explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.