

Subject Description Form

Subject Code	LSGI3781
Subject Title	Engineering Surveying
Credit Value	4
Level	3
Pre-requisite/ Co-requisite	LSGI2373 Surveying (Pre-requisite); LSGI2341A Survey Adjustment (Co-requisite)
Objectives	<ul style="list-style-type: none"> • To enable students to understand the basic principles of construction surveying • To offer opportunities for students to practice fundamental methods of construction surveying • To enhance the ability and skills of the students in analysing survey methods and survey data <p>The subject also aims at developing students' critical and creative thinking ability and skills and cooperative attitudes and behaviour of working with others through discussions and group projects.</p>
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. Understand the basic principles and methods of construction surveying (L2) b. Use commonly used methods to measure and compute areas and volumes and understand the limitations of each method (L3) c. Read and interpret construction drawings (L3) d. Analyse quality of construction surveys (L3) e. Carry out surveys for common construction projects such as slope work and building, bridge and road constructions (L2) and f. Perform basic road alignment design and computations (L3)
Subject Synopsis/ Indicative Syllabus	<p>A. Measurement and Computation of Areas and Volumes (30%) Graphical method; areas from triangles and coordinates; trapezoidal rule and Simpson's rule for area computation; use of planimeter; bulking and shrinkage of materials; volumes of pyramid, prism and wedge; end area and prismatic methods for volume computation; volumes from spot heights, contours and digital terrain models; drawing of mass haul diagram; properties of mass haul diagram.</p> <p>B. Construction Drawings (5%) interpretation of construction drawings.</p> <p>C. Setting Out Surveys (25%)</p>

	<p>Basic concepts of setting out; methods for position measurement in setting out surveys; control surveys; quality analysis in setting out surveys; responsibilities in setting out surveys; verticality control;</p> <p>D. Road Alignment and Sectioning (40%) Computation of circular, spiral and parabolic curves; concept of superelevation; transition; setting out of horizontal and vertical curves. longitudinal and cross-sections; guidelines for road alignment design.</p>																																																													
Teaching/Learning Methodology	Both on-line and normal class delivery modes are used. The subject materials are uploaded for students to download. Students are encouraged to ask questions face to face or via emails. Students' practical skills will be developed through a series of practical exercises and site visits. Students' abilities and skills of critical and creative thinking will be enhanced through discussing and solving various challenging problems in the subject area. Attitudes and behaviour of working with others will be cultivated through a number of group projects.																																																													
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1" data-bbox="529 779 1370 1314"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> <th>f</th> </tr> </thead> <tbody> <tr> <td>1. Phase tests</td> <td>15</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Practical work</td> <td>15</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>3. Survey camp</td> <td>20</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>4. Examination</td> <td>50</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td colspan="6"></td> </tr> </tbody> </table> <p>Students' practical work will be assessed based on observations of student performance in practical exercises, and practical tests followed by an oral interview at the end of the term.</p> <p>Students' understanding on different expected learning outcomes on the concepts and theories will be assessed with phase tests and an end-of-year exam. Students' abilities and skills of critical and creative thinking will be assessed with challenging problems embedded in the tests, exam and practical work, and their attitudes and behaviour of working with others will be assessed through various group field work.</p>								Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						a	b	c	d	e	f	1. Phase tests	15	✓	✓	✓	✓	✓	✓	2. Practical work	15	✓	✓	✓	✓	✓	✓	3. Survey camp	20	✓	✓	✓	✓	✓	✓	4. Examination	50	✓	✓	✓	✓	✓	✓	Total	100 %						
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Student Study Effort Expected	Class contact:																																																													
	<ul style="list-style-type: none"> ▪ Lecture/tutorials 						26 Hrs.																																																							
	<ul style="list-style-type: none"> ▪ Practical work 						39 Hrs.																																																							

	<ul style="list-style-type: none"> ▪ Survey camp 	40 Hrs.
	Other student study effort:	
	<ul style="list-style-type: none"> ▪ Reading, analysis of survey data, and report writing 	35 Hrs.
	Total student study effort	140 Hrs.
Reading List and References	<ol style="list-style-type: none"> 1. Schofield, W. (2007) Engineering Surveying, Butterwoth-Heinemann. 2. Kavanagh, B.F. (2003) Surveying with Construction Applications, Pearson Prentice Hall. 3. Uren, J., & Price, B. (2018). <i>Surveying for engineers</i>. Bloomsbury Publishing. 4. McCormac, J. C., Sarasua, W., & Davis, W. J. (2012). <i>Surveying</i>. John Wiley & Sons. 5. Crawford, W. G. (2002). Construction surveying and layout. Creative Construction Publishing, 3(2). 6. Kavanagh, B. F., & Slattery, D. K. (2010). <i>Surveying: with construction applications</i>. Upper Saddle River, NJ, USA: Pearson. 7. Nathanson, J. A., Lanzafama, M. T., & Kissam, P. (2011). <i>Surveying fundamentals and practices</i>. Pearson/Prentice Hall. 8. Kelly, W. (2020). Setting Out For Construction: A Practical Guide to Site Surveying. <i>Civil Engineering Surveyor</i>. 	