# Subject Description Form

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| **Subject Code** | LSGI2296 |
| **Subject Title** | **Computer Aided Drafting and Engineering Drawings** |
| **Credit Value** | 3 |
| **Level** | 2 |
| **Pre-requisite/ Co-requisite/ Exclusion** | Nil |
| **Objectives** | The aim of this subject is to allow students gain solid knowledge in descriptive geometry, engineering drawing and computer aided drafting (2D and 3D). Through the use of these software package students should acquire working experience to use, modify, reformat and import/export digital map data and engineering designs. This subject emphasize on independent learning with the help of demonstrations and self-learning package that will help students to develop independent learning ability. Preparation of technical reports will enhance students' English writing and presentation skills. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br>a. Use basic scientific computing tools (L2)<br>b. Apply a computer aided drafting software package for surveying and mapping and engineering drawings (L3)<br>c. Prepare and produce a survey plan and/or engineering drawing with a CAD software (L3)<br>d. Apply 3D drawing skill to create 3D BIM model (L3) |
| **Subject Synopsis/ Indicative Syllabus** | **Basic Scientific Computing for Engineering (10%)**<br>    Survey and cartographic calculations using Matlab.<br>**Engineering drawing (20%)**<br>    Symbology, dimensioning and styles.<br>**Map Elements Manipulation Using CAD System (25%)**<br>    2D element creation and manipulation; group manipulation;<br>    Layering; text creation and manipulation.<br>**Production of Survey Plan and engineering drawing (25%)**<br>    Plans and profiles; design composition.<br>**Production of 3D Architectural Model (20%)**<br>    3D model creation, editing and modifying of building components. |
| **Teaching/Learning Methodology** | Teaching material providing main concepts and theories will be presented through an e-learning platform and will be supplemented by tutorial sessions. Students are expected to gain more hands-on experiences focused on surveying and cartographic applications through formal self-learning and in-class tutorials and through practical assignments. The subject will first address the basic principles of CAD and scientific computing tools.  MicroStation, and BIM software are used for design composition, rendering model and the production of a survey plan. Ten weeks will be spent at Industrial Centre in |

| | practical classes on AutoCAD and BIM software and will focus on building design. | | | | | |
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| **Assessment Methods in Alignment with Intended Learning Outcomes** | Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | |
| | | | a | b | c | d |
| | 1. Quizzes and Tests (AutoCAD & BIM) | 40% | ✓ | ✓ | ✓ | ✓ |
| | 2. AutoCAD | 20% | | ✓ | ✓ | |
| | 3. BIM tools | 20% | | ✓ | ✓ | ✓ |
| | 4. MicroStation Project | 20% | ✓ | ✓ | ✓ | ✓ |
| | Total | 100 % | | | | |

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Continuous assessment consists of practical assignments in MicroStation, AutoCAD and an individual project. In practical assignments, students are assessed on their knowledge and skills with manipulating MicroStation base and AutoCAD software to design an engineering drawing. BIM tools are used to create architectural model. The AutoCAD and BIM assignments and quizzes are handled by Industrial Centre. The individual CAD project is designed to encourage students to acquire broader and in-depth understanding of CAD software in preparing and composing a survey plan.

| **Student Study Effort Expected** | Class contact: | |
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| | ▪ Tutorial sessions (MicroStation, Matlab) | 12 Hrs. |
| | ▪ Lab sessions (AutoCAD and BIM, Industrial Centre) | 30 Hrs. |
| | Other student study effort: | |
| | ▪ On-line lecture and preparation work for tutorial classes (MicroStation, Matlab) | 30 Hrs. |
| | ▪ Preparation work for AutoCAD and BIM | 14 Hrs. |
| | ▪ MicroStation project | 20 Hrs. |
| | Total student study effort | 106 Hrs. |

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| **Reading List and References** | A. L. Anderson (2002) *MicroStation V8 An introduction to Computer-Aided Design*, SDC publications, PolyU call number TA174.A54 2002 |
| | P.A. Mann (2014) MicroStation V8i Training Manual 2D Level 1. |
| | AutoCAD online documentation and tutorials available at http://docs.autodesk.com |
| | D. Derakhshani (2015) Introducing Autodesk Maya 2016: Autodesk Official Press, Sybex, USA. |
| | D.J. Stine (2022) Design Integration Using Autodesk Revit 2023 |
| | Architecture, Structure and MEP, SDC Publications. |