

## Subject Description Form

Subject Code	<b>BSE3312</b>
Subject Title	<b>Piped Services</b>
Credit Value	3
Level	3
Pre-requisite Co-requisite Exclusion	BSE2215 Fluid Mechanics, or equivalent. Nil Nil
Objectives	<p>This subject aims at:</p> <ol style="list-style-type: none"> <li>1. Equipping students with the abilities required in designing basic water supply and drainage systems in buildings, taking into consideration of the demand characteristics in buildings and performance characteristics of the systems; and</li> <li>2. Developing student competence in making relevant decision that complies to engineering requirements and regulations/codes on the systems.</li> </ol>
Intended Learning Outcomes	<ol style="list-style-type: none"> <li>a) Able to design, operate and maintain basic systems for water supply and drainage services in buildings.</li> <li>b) Able to evaluate the basic system performance and provide solutions for system improvements.</li> <li>c) Able to link fundamental knowledge with practical design and make rational system choices related material and equipment selection.</li> </ol>
Subject Synopsis/ Indicative Syllabus	<p><b>System demand fundamentals:</b> simultaneous demands, fixture unit approach; consumption and storage, code procedures and design examples.</p> <p><b>Potable, flushing and hot water supply:</b> performance requirements, water quality objective, water distribution systems, piping network, tank and pumping arrangements, water networks, matching of pump and piping system, energy consumption, water hammer solutions, piped temperature gradient, heating energy consumption. Pipe sizing, selection criteria, materials, distribution and system design in buildings. Rules, regulations, standard and industrial practices, practical designs.</p> <p><b>Sanitation, drainage and sewage:</b> sanitation service and provisions, system arrangements, gravity flow, drainage stack and ventilation, trap seal loss, health and safety, slope drainage flow, sedimentation, pressure variations and ventilation, water quality and treatment, grey water, water recycling and sustainable measures, surface water, pipe sizing, policy, rules and regulations, practical designs.</p> <p><b>Miscellaneous pipe services:</b> piped gases fundamentals, LPG, town gas, compressed air and vacuum, medical gases. Sewage treatment system. Refuse disposal. Legislation and safety.</p>
Teaching/Learning Methodology	<p>The realisation of the learning outcomes will be based on lectures, assignments, tutorials, laboratory experiments and directed reading.</p> <p>Lectures will be used to introduce topics and the necessary fundamentals, design criteria backed up by multimedia aids. Assignments and design tasks at appropriate intervals will emphasise and practice choice of solutions and the factors of performance and economic; much of the directed reading will be encompassed at this theme.</p> <p>Tutorials will provide the opportunity for questions and discussions on any problems related to lectures, assignments and case studies.</p> <p>Laboratory will provide practical experience basic systems and evaluating system performance from measurements.</p>

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		
	Continuous Assessment *	100	✓	✓	✓		
	Total	100					
<p>* For details, please refer to the 2020/21 Semester 1 Subject teaching scheme/schedule.</p> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Based on examination mark 60% and coursework assessment mark 40%. The coursework assessment is made up of laboratory reports, in-class test(s) and student-based design task(s) with written report(s). Written assessments bias to evaluate the learning outcomes (a) and (b). Students are expected to apply the delivered subject contents to solve for designed questions. Student-based design tasks and laboratory works are used to evaluate the learning outcomes (c). Written examination is used to evaluate all the specified learning outcomes.</p>							
Student Study Effort Expected	Class contact:						
	▪ Lecture		24 Hrs.				
	▪ Tutorial		7 Hrs.				
	▪ Laboratory		6 Hrs.				
	▪ Assessment		2 Hrs.				
	Other student study effort:						
	▪ Review subject content		39 Hrs.				
	▪ Additional reading, preparation for assessments		39 Hrs.				
	▪ End-of-semester examination		3 Hrs.				
	Total student study effort		120 Hrs.				
Reading List and References	<p>Plumbing Engineering Services Design Guide, IOP, UK.</p> <p>Water, Sanitary and Waste Services for Buildings, A.F.E. Wise.</p> <p>Sewage Manual Part I, Drainage Services Department, HKSAR.</p> <p>Storm water Drainage Manual, Drainage Services Department, HKSAR.</p> <p>Building Regulations (Hong Kong).</p>						