

<b>Subject Code</b>	BSE2S01S
<b>Subject Title</b>	Science for Healthy and Sustainable Living Environments
<b>Hosting Department</b>	Department of Building Services Engineering
<b>Level</b>	2
<b>Class Quota</b>	60
<b>Medium of Instruction</b>	English
<b>Subject Duration</b>	Summer Term
<b>Teaching Staff</b>	Dr. KW Mui and Dr. LT Wong
<b>Target Students</b>	GUR, open for students from FENG, FCE and FAST
<b>Pre-requisites</b>	Nil
<b>Selection of Students Required?</b>	No
<b>Subject Synopsis</b>	<p><i>Concepts and Practices of Service Learning:</i></p> <ul style="list-style-type: none"> <li>• Principles, concepts and myths of service learning</li> <li>• Benefits of service learning to students, the university and the community</li> <li>• Ethical issues in service learning</li> <li>• Basic concepts and theories of social problems, justice and development</li> <li>• Social responsibilities of global citizens as intellectuals and professionals</li> <li>• Proper attitudes and behaviours in service delivery</li> <li>• Development of a service project proposal/plan</li> <li>• Effective teamwork and problem solving skills in service learning projects</li> <li>• Reflection as a tool for learning</li> </ul> <p><i>Discipline-Specific Concepts, Issues and Skills</i></p> <ul style="list-style-type: none"> <li>• Principles of sustainability; concepts of sustainable built environment and green buildings;</li> <li>• Scientific method and inquiry; formulation, hypothesis, prediction and experiment;</li> <li>• Applications of basic scientific methods and scientific thinking to everyday experiences and global concerns in relation to build environments: e.g. quantification of sustainability, consumption, efficiency and conservation of energy, water and other resources, reduction of wastes and disposals</li> <li>• Environmental, financial, cultural and socioeconomic challenges faced by underprivileged people relating to sustainability and living environment, particularly relating to the capability to achieve and maintain sustainable practices or a healthy living environment.</li> </ul>

	<p><i>Project-Specific Concepts, Issues and Skills</i></p> <ul style="list-style-type: none"> <li>• Scientific concepts and practices in teaching and demonstrating science and sustainability concepts, including teaching methods, classroom management and communication</li> <li>• Moral and ethical concerns related to working with children and young people in a school setting.</li> </ul>
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**Service Project**

<p><b>What will students do to serve?</b></p>	<p>Students will visit grass roots families to learn about their living situation especially with respect to energy efficiency and sustainability in everyday life in Hong Kong. Students may have to conduct interviews and surveys to get a sense of issues such as energy usage, water usage, etc. Student will then use this experience to design learning activities for primary or secondary school students, and will be required to integrate issues of sustainability into their activities and use interactive and learner-centered activities.</p> <p>Our target is to work with primary and secondary schools that serve mostly underprivileged children, so the issues that our students encounter in their preparatory site visit should be familiar to the primary and secondary students. We intend our service to fit into the Other Learning Activities (OLE) component in the primary and secondary school curriculum frameworks. The schools that we will work with lack the extra resources required to support such activities.</p> <p>Examples of project topics include: water and energy efficiency, environmental quality monitoring, trash reduction and waste audit respectively. Examples of service project topics include: benchmarking utility consumption in home consumption (water, fuel gas and electricity), willingness in adopting energy efficient/water conservation appliances, home waste quantification, trend of air pollution, measurement of indoor temperature and energy impacts, noise assessment etc. Students will have to integrate examples from built environment sustainability, organize relevant and meaningful learning activities, demonstrate engineering experiments, design teaching materials and worksheets, etc. The activities for the primary and secondary students will end with a project, in which our students will act as instructors and mentors to the schoolchildren.</p>
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<p><b>Whom will students serve?</b></p>	<p>Underprivileged children</p>
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<p><b>Where will students serve?</b></p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Hong Kong</td> <td style="width: 40%;">District: Secondary schools in Tuen Mun or Fanling</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Chinese mainland</td> <td>Province: _____</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Taiwan</td> <td>City: _____</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Macau</td> <td>_____</td> </tr> </table>	<input checked="" type="checkbox"/>	Hong Kong	District: Secondary schools in Tuen Mun or Fanling	<input type="checkbox"/>	Chinese mainland	Province: _____	<input type="checkbox"/>	Taiwan	City: _____	<input type="checkbox"/>	Macau	_____
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<input type="checkbox"/>	Macau	_____											

Remarks: The information given above is subject to change.

	<input type="checkbox"/> Overseas                      Country: _____ City: _____
<b>When will students serve?</b>	<p>It is compulsory to attend all service activities in June/July to fulfill the 40 service-hour requirement:</p> <p>Group A (Service school: Fanling Kau Yan College)</p> <p>20 Jun 2019 – 3 hours in the afternoon (exact time to be confirmed)</p> <p>24-26 Jun 2019 – 8 a.m. to 5 p.m.</p> <p>15 Jul 2019 – 6 hours in the afternoon</p> <p>17 Jul 2019 – 8 a.m. to 5 p.m.</p> <p><u>OR</u></p> <p>Group B (Service school: Baptist Wing Lung Secondary School)</p> <p>27 Jun 2019 – 3 hours in the afternoon (exact time to be confirmed)</p> <p>5, 8-9 Jul 2019 – 8 a.m. to 5 p.m.</p> <p>16 Jul 2019 – 6 hours in the afternoon</p> <p>17 Jul 2019 – 8 a.m. to 5 p.m.</p> <p>For details, please refer to the <b>tentative teaching schedule</b> appended.</p>
<b>Fee payable by students</b>	N/A
<b>Enquiry</b>	<p>Dr. KW Mui, Tel: 2766 5835, email: <a href="mailto:horace.mui@polyu.edu.hk">horace.mui@polyu.edu.hk</a></p> <p>Dr. L.T. Wong, Tel: 2766 7783, email: <a href="mailto:ling-tim.wong@polyu.edu.hk">ling-tim.wong@polyu.edu.hk</a></p>

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## Teaching Schedule

**Subject: BSE2S01 - Science for Healthy and Sustainable Living Environments**

**Lecturer:** Dr. Horace K.W. Mui, HM (BSE); **Ext:** 27665835; **e-mail:** [horace.mui@polyu.edu.hk](mailto:horace.mui@polyu.edu.hk)

Dr. L.T. Wong, LTW (BSE); **Ext:** 27667783; **e-mail:** [beltw@polyu.edu.hk](mailto:beltw@polyu.edu.hk)

Wk	Date	Topics	Activities	Group	hrs	Venue
1	27 May	Introduction and key concepts	Lecture (HM/LTW)	A & B	3 (6:30 - 9:30pm)	TU101
1-4		<b>Self-learning of E-learning module on Service-Learning</b>			<b>10</b>	-
2	3 Jun	Principles of sustainability; Indoor environmental assessment (IEQ) in buildings, concepts of sustainable built environment and green buildings, linked with BSE?	Lecture (HM/LTW)	A & B	3 (6:30 - 9:30pm)	TU101
2	5 Jun	Benchmarking system of energy and water consumption in buildings	Lecture (HM/LTW)	A & B	2 (6:30 – 8:30pm)	N102
3	10 Jun	Experimental instruments, techniques and safety	Workshop (HM/LTW)	A & B	2 (6:30 – 8:30pm)	BSE laboratory
3	12	Development of service project proposal / plan;	Lecture	A & B	3 (6:30 - 9:30pm)	N102

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	Jun	Submission of outline proposal	(OSL + HM/LTW)			
4	17 Jun	Reflection and review tutorials / sessions (Planning for rendering service) <b>[Group submission of service project proposal + 1-page summary for secondary school students Submit to Blackboard]</b>	Workshop (OSL + HM/LTW)	A & B	3 (6:30 - 9:30pm)	TU101
4	19 Jun	Development of service-learning project + Reflection and review	Workshop (OSL + HM/LTW)	A & B	1 + 2 (6:30 - 9:30pm)	N102



Group A (Fanling Kau Yan College )					Group B (Baptist Wing Lung Secondary School )					
Date	Topics	Activities	hrs	venue	Date	Topic	Activities	hrs	venue	
20 Jun (Thu) PM	Briefing of rendering service + reflection	Rendering service (HM/LTW+OSL)	2 + 1	<b>Secondary School</b>	27 Jun (Thu) PM	Briefing of rendering service + reflection	Rendering service (HM/LTW+OSL)	2 + 1	<b>Secondary School</b>	
21 Jun (Fri)	Development of service-learning project (II) <b>[Individual submission of 1<sup>st</sup> reflective journal (1200 words)]</b>	Workshop (HM/LTW+OSL)	3	TU103	2 Jul (Tue)	Development of service-learning project (II) <b>[Individual submission of 1<sup>st</sup> reflective journal (1200 words)]</b>	Workshop (HM/LTW+OSL)	3	N001	
24-26 Jun (Mon-Wed)	Direct service, preparation of project in Secondary School plus 60 minutes reflection session	Rendering service (HM/LTW+OSL)	(8 + 1.5) x 3	<b>Secondary School</b> <b>(0800 – 1700)</b>	5, 9-10 Jul (Fri, Tue-Wed)	Direct service, preparation of project in Secondary School plus 60 minutes reflection session	Rendering service (HM/LTW+OSL)	(8 + 1.5) x 3	<b>Secondary School</b> <b>(0800 – 1700)</b>	
15 Jul (Mon) PM	Preparation and rehearsal for project presentation	Rendering service (HM/LTW+OSL)	6	<b>Secondary School</b>	16 Jul (Tue) AM	Preparation and rehearsal for project presentation	Rendering service (HM/LTW+OSL)	6	<b>Secondary School</b>	
17 Jul (Wed)	<b>Project presentation + PolyU visit + 60 minutes reflection session</b>				<b>Seminar (LTW+HM+OSL)</b>				<b>8 + 1.5</b>	<b>PolyU main campus</b>

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**21 Jul**

**[Individual submission of 2<sup>nd</sup> reflective journal & submission of final summative group report]**

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<b>Student Study Effort Expected</b>	<b>e-Learning Module</b>	10 Hrs.
	<b>Class contact:</b>	
	<ul style="list-style-type: none"><li>• Discipline-Specific Lectures, Seminars, Tutorials and/or Workshops</li></ul>	10 Hrs.
	<ul style="list-style-type: none"><li>• Project-Specific Lectures, Seminars, Tutorials and/or Workshops</li></ul>	4 Hrs.
	<ul style="list-style-type: none"><li>• Reflection and review tutorials and sessions</li></ul>	15 Hrs.
	<b>Other student study effort:</b>	
	<ul style="list-style-type: none"><li>• Readings, self-study, and planning and preparation for the service project</li></ul>	25 Hrs.
	<ul style="list-style-type: none"><li>• Direct rendering of service</li></ul>	40 Hrs.
	<ul style="list-style-type: none"><li>• Reflection and review</li></ul>	25 Hrs.
	<b>Total student study effort</b>	129 Hrs.

**Assessment:**

1. Based on 100% continuous assessment mark.
2. The continuous assessment mark is made up of e-learning module (5%), plans/proposals for service (25%), two reflective journals, a final summative report and presentation (30%), performance in rendering service (40%) respectively.
3. Each group of PolyU students are required to work on one topic and submit a written group proposal (up to 5 pages). The proposed topic will be approved in the fourth week of the summer term. For the reflective journal, each student is required to

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submit 2 reflective journals respectively. At the end of summer semester (21 July 2019), each group is also required to submit a final summative report.

4. For the presentation/exhibition, each group of PolyU and the secondary school students is required to perform a 20-min presentation in PolyU.



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### Reading List:

1. Cress, C.M., Collier, P.J. & Reitenauer, V.L. (2005). Learning Through Serving: A Student Guidebook for Service-Learning Across the Disciplines. Stylus Publishing.
2. Halliday, S. (2008). Sustainable construction. Butterworth-Heinemann.
3. Edwards, B. (2005). Rough Guide to Sustainability. RIBA Enterprises.
4. Geoffrey, B.A., Claes, G.G. (2011). Green Nonotechnology: Solutions for the Sustainability and Energy in the Built Environment. CRC Press.
5. Adams, M., Blumenfeld, W., Castañeda, C.R., Hackman, H.W., Peters, M.L., Zúñiga, X. (Ed.) (2010). Readings for Diversity and Social Justice. Routledge.
6. Johnson, A. (2005). Privilege, Power, and Difference. McGraw-Hill.
7. <http://greenliving.nationalgeographic.com/>.
8. Technical Note AIVC 28. A guide to air change efficiency. Air Infiltration and Ventilation Centre, 1990.
9. [http://www.unesco.org/education/tlsf/mods/theme\\_gs/mod0a.html5](http://www.unesco.org/education/tlsf/mods/theme_gs/mod0a.html5). Guidelines for Air Quality, WHO Sustainable Development and Healthy Environments, Protection of the Human Environment Occupational and Environmental Health, 2000.

(7 May 2019)

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