

## Subject Description Form

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|--|---|
| <b>Subject Code</b>                              | BME1D03   |
| <b>Subject Title</b>                             | Technologies for Smart Ageing   |
| <b>Credit Value</b>                              | 3   |
| <b>Level</b>                                     | 1   |
| <b>Pre-requisite</b>                             | Nil   |
| <b>Objectives</b>                                | <p><b>The objectives of this subject are to:</b></p> <ol style="list-style-type: none"> <li>a. Introduce the concept and trends of smart ageing city from technology perspectives;</li> <li>b. Illustrate the cutting-edge technological solutions to the challenges of super-aged city like Hong Kong in coming 30 years;</li> <li>c. Critically explore the major socioeconomic and healthcare barriers for technology revolution and transfer.</li> </ol>  |
| <b>Intended Learning Outcomes</b>                | <p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a. Understand ideological and theoretical underpinning of smart ageing city;</li> <li>b. Describe the emerging and increasing demands of Hong Kong as a super- aged city;</li> <li>c. Articulate the major technological approaches to facilitate smart living; and</li> <li>d. Relate their own disciplines to this CAR subject</li> </ol>   |
| <b>Subject Synopsis/<br/>Indicative Syllabus</b> | <ol style="list-style-type: none"> <li>a. Introduction and Overview <ul style="list-style-type: none"> <li>▪ The unmet needs of a rapid growth of aged population in Hong Kong, China and around the world.</li> <li>▪ Fundamental knowledge and scientific perspectives of ageing and age-related pathologies</li> <li>▪ The concept of smart ageing city</li> <li>▪ Health data technology development and transfer, and</li> <li>▪ The trend of technology development for healthy and smart ageing</li> </ul> </li> <li>b. Technological solutions to the challenges of super-aged city and to address all necessities of life including but not limited to following aspects: <ul style="list-style-type: none"> <li>➤ <b>Technologies to promote healthy ageing</b>, e.g. <ul style="list-style-type: none"> <li>• Health and wellness monitoring using <i>wearable sensors</i>;</li> <li>• Intelligent home for the elderly;</li> <li>• Smart medical devices for food safety to monitor salt and sugar intake;</li> <li>• Natural extracts and micro-nutrition for promoting healthy ageing;</li> </ul> </li> <li>➤ <b>Technologies to improve active ageing</b> through <ul style="list-style-type: none"> <li>• Medical robotics for stroke rehabilitation and elderly care;</li> </ul> </li> </ul> </li> </ol> |

|   |   |   |   |          |          |          |          |
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|   | <ul style="list-style-type: none"> <li>• Intelligent wheelchair for disabled people to enhance the mobility;</li> <li>• Prosthetics and orthotics technologies for fall prevention and mobility in older people;</li> <li>• Artificial intelligence for elderly care.</li> </ul> <p>c. Laboratory session with hand-on experience on the equipment and devices displayed in the library of Jockey Club Smart Aging Hub.</p>   |   |   |          |          |          |          |
| <p><b>Teaching/Learning Methodology</b></p>                                   | <p>It is an introductory course for the undergraduate students from all disciplines in order to facilitate them to gain the basic knowledge about the healthcare- related technologies.</p> <p>In the lectures, experts’ experiences in technology development and transfer for smart ageing city will be shared. The <b>guided reading</b> and <b>self-study</b> will be further extended students’ knowledge in the respective areas. In preparing the <b>guided group discussion in tutorials</b>, students will actively participate in the laboratory session in the <i>Jockey Club Smart Ageing Hub</i> and obtain the first-hand experiences on the cutting-edge technologies tailor-made for elderly and disabled persons. Students will critically evaluate themselves during the group discussion. The group discussion and students’ preparatory work will facilitate their writing of the essay. In the <b>student group presentation</b>, they will present the basic principles and findings from their laboratory sessions. What they learn from the lectures and tutorials will also be reflected in this group discussion and sharing, self-study, and student presentation.</p> |   |   |          |          |          |          |
| <p><b>Assessment Methods in Alignment with Intended Learning Outcomes</b></p> | <p>Specific assessment methods/tasks</p>  | <p>% Weighting</p>  | <p>Intended subject learning outcomes to be assessed (Please tick as appropriate)</p> |          |          |          |          |
|   | <p>Short quiz</p>   | <p>30</p>   | <p>v</p>  | <p>v</p> | <p>v</p> | <p></p>  |          |
|   | <p>Presentation</p>   | <p>30</p>   | <p>v</p>  | <p>v</p> | <p>v</p> | <p></p>  |          |
|   | <p>Writing assignments</p>  | <p>Reflection of laboratory session</p>   | <p>10</p>   | <p>v</p> | <p></p>  | <p>v</p> | <p></p>  |
|   | <p>Writing assignments</p>  | <p>Reflection of their own discipline and/or personal experience in critical assessments of smart ageing technologies</p> | <p>30</p>   | <p>v</p> | <p>v</p> | <p>v</p> | <p>v</p> |
|   | <p>Total</p>  |   | <p>100</p>  | <p></p>  | <p></p>  | <p></p>  | <p></p>  |

|   | <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <table border="1" data-bbox="451 293 1541 972"> <thead> <tr> <th data-bbox="451 293 691 427">Specific assessment methods/tasks</th> <th data-bbox="691 293 1541 427">Contents</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 427 691 577">Short quiz</td> <td data-bbox="691 427 1541 577"><i>Quiz with short MCQs will be conducted after lectures to facilitate the students to catch up the key learning points.</i></td> </tr> <tr> <td data-bbox="451 577 691 719">Presentation</td> <td data-bbox="691 577 1541 719"><i>In groups: basic principles of smart ageing city and evaluations of technological solutions to the challenges of super aged city.</i></td> </tr> <tr> <td data-bbox="451 719 691 972">Essay</td> <td data-bbox="691 719 1541 972"><i>Individual: reviewing the principles of smart ageing technologies, claimed health benefits, mechanism of improving health and their hidden issues. Students will also include their own experiences and critical review - the pros and cons of such technologies. Guided group discussion will facilitate students to prepare the essay in high quality.</i></td> </tr> </tbody> </table> |            | Specific assessment methods/tasks | Contents    | Short quiz | <i>Quiz with short MCQs will be conducted after lectures to facilitate the students to catch up the key learning points.</i> | Presentation | <i>In groups: basic principles of smart ageing city and evaluations of technological solutions to the challenges of super aged city.</i> | Essay | <i>Individual: reviewing the principles of smart ageing technologies, claimed health benefits, mechanism of improving health and their hidden issues. Students will also include their own experiences and critical review - the pros and cons of such technologies. Guided group discussion will facilitate students to prepare the essay in high quality.</i> |         |   |         |                            |          |  |
|---|--|------------|-----------------------------------|-------------|------------|--|--------------|--|-------|---|---------|---|---------|----------------------------|----------|--|
| Specific assessment methods/tasks                               | Contents   |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| Short quiz  | <i>Quiz with short MCQs will be conducted after lectures to facilitate the students to catch up the key learning points.</i>   |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| Presentation  | <i>In groups: basic principles of smart ageing city and evaluations of technological solutions to the challenges of super aged city.</i>   |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| Essay   | <i>Individual: reviewing the principles of smart ageing technologies, claimed health benefits, mechanism of improving health and their hidden issues. Students will also include their own experiences and critical review - the pros and cons of such technologies. Guided group discussion will facilitate students to prepare the essay in high quality.</i>  |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| <p><b>Student Study Effort Expected</b></p>                     | <p>Class contact:</p> <table border="1" data-bbox="435 1039 1281 1541"> <tbody> <tr> <td data-bbox="435 1039 1281 1106">▪ Lectures</td> <td data-bbox="1281 1039 1557 1106">27 Hrs.</td> </tr> <tr> <td data-bbox="435 1106 1281 1173">▪ Tutorials</td> <td data-bbox="1281 1106 1557 1173">9 Hrs.</td> </tr> <tr> <td data-bbox="435 1173 1281 1240">▪ Laboratory</td> <td data-bbox="1281 1173 1557 1240">3 Hrs.</td> </tr> <tr> <td colspan="2" data-bbox="435 1240 1281 1308">Other student study effort:</td> </tr> <tr> <td data-bbox="435 1308 1281 1375">▪ Preparation for quiz and presentation</td> <td data-bbox="1281 1308 1557 1375">18 Hrs.</td> </tr> <tr> <td data-bbox="435 1375 1281 1476">▪ Self study (reading the books and journals) and writing essay</td> <td data-bbox="1281 1375 1557 1476">60 Hrs.</td> </tr> <tr> <td data-bbox="435 1476 1281 1541">Total student study effort</td> <td data-bbox="1281 1476 1557 1541">117 Hrs.</td> </tr> </tbody> </table>   | ▪ Lectures | 27 Hrs.                           | ▪ Tutorials | 9 Hrs.     | ▪ Laboratory   | 3 Hrs.       | Other student study effort:  |       | ▪ Preparation for quiz and presentation   | 18 Hrs. | ▪ Self study (reading the books and journals) and writing essay | 60 Hrs. | Total student study effort | 117 Hrs. |  |
| ▪ Lectures  | 27 Hrs.  |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| ▪ Tutorials   | 9 Hrs.   |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| ▪ Laboratory  | 3 Hrs.   |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| Other student study effort:                                     |  |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| ▪ Preparation for quiz and presentation                         | 18 Hrs.  |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| ▪ Self study (reading the books and journals) and writing essay | 60 Hrs.  |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| Total student study effort                                      | 117 Hrs.   |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |
| <p><b>Reading List and References</b></p>                       | <p>The recommended books:</p> <ul style="list-style-type: none"> <li>▪ Abdulmotaleb El Saddik, M. Shamim Hossain, Burak Kantarci (2020). <i>Connected Health in Smart Cities</i>. Springer Cham</li> <li>▪ Tiago Moreira (2017). <i>Science, technology and the ageing society</i>. New York, NY : Routledge.</li> <li>▪ Katarina Friberg Felsted Scott D. Wright (2014). <i>Toward post ageing: technology in an ageing society</i>. Cham : Springer.</li> </ul>  |            |                                   |             |            |  |              |  |       |   |         |   |         |                            |          |  |