# Subject Description Form

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>HSS5003</th>
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<tbody>
<tr>
<td><strong>Subject Title</strong></td>
<td>Personal Protective Equipments in Infection Control</td>
</tr>
<tr>
<td><strong>Credit Value</strong></td>
<td>3</td>
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<tr>
<td><strong>Level</strong></td>
<td>5</td>
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</tbody>
</table>
| **Responsible staff & Department/School** | Prof. Li Yi (ITC)  
Dr Guo Yue-Ping (ITC) |
| **Pre-requisite / Co-requisite / Exclusion** | Exclusion for students of MSc Programme 55005 only:  
Students of MSc 55005 can choose to take either HSS5003 or HTI5619 but not both.  
*HTI5619 Professional Development in Infection Control Practice |
| **Objectives** | 1. Study in-vivo protective performance of masks in terms of their physical properties, filtration efficiency and usability, and transmission pathways of virus-laden respiratory droplets.  
2. Examine the effects of wearing different kinds of masks on thermophysiological responses and subjective perceptions of discomfort.  
3. Obtain an understanding of through-precautions transmission situation and identify the protective performance of design and fabric characteristics of PPE.  
4. Evaluate the hand and environmental contamination levels when healthcare staffs follow a personal or causal method and a CDC removal gloves method at different distances.  
5. Find out the physiological cost of wearing different PPE ensembles.  
6. Evaluate subjective sensation, usability, satisfaction and preference of wearing different PPE ensembles.  
7. Clarify how moisture transport properties, thermal properties and fabric and fiber characteristics of PPE influence thermoregulatory responses of the wearers. |
**Intended Learning Outcomes**

Upon completion of the subject, students will be able to:

a. Demonstrate understanding of the transmission pathways of infectious diseases and how to use Personal Protective Equipments (PPE) in infection control.

b. Identify the critical issues of using personal protection equipments in infection control.

c. Evaluate PPE critically in terms of usability and performances with the knowledge of testing relevant methods and standards.

d. Analyze and select PPE for specific purposes by applying the scientific knowledge and principles of design and engineering of PPE.

**Subject Synopsis/Indicative Syllabus**

**Keyword syllabus:**

1. **PPE in Infection Control**
   - Infectious diseases
   - Respiratory protective devices, protective clothing and PPE ensemble

2. **Protective efficiency**
   - Spreading of pathogenic organism in PPE
   - PPE for prevention of pathogenic organism’s transmission
   - The filter classification system of respirators
   - The protective efficiency of PPE

3. **The physiological effects of wearing PPE**
   - Resistance to breathing, dead air space, and effects on physical performance and respiratory function
   - Heat stress and cardiovascular stress
   - The autonomic nervous system and hormones
   - The oxidative stress

4. **Psychological impact of wearing PPE**
   - Subjective ratings of sensation of humidity, hotness and thermal comfort
   - The preferences of subjects for different types of PPE

5. **Fabric physical properties**
   - Fabric water repellence, resistance to liquid water penetration, structure and density and PPE barrier properties
   - Air permeability, water vapour permeability, moisture management properties and thermal conductance
   - Weight and thickness of the protective clothing materials

6. **Guidelines for front-line health care workers in choosing and using PPE**
   - Overall evaluation in PPE
   - Guidelines in choosing and using correct PPE in the right context

**Teaching/Learning Methodology**

1. Lectures
2. Lab visit and practice on PPE physical properties
3. Computer simulations on PPE thermal functional performance with Ethermal website
4. Instruction for Group project proposal
5. Instruction for Group project data analysis
6. Video: Fit checking & Fit testing
   (Influenza Respirator Fit Testing Qualitative Method)
7. Video: Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Assessment Methods in Alignment with Intended Learning Outcomes</th>
<th>Specific assessment methods/tasks</th>
<th>% weighting</th>
<th>Intended subject learning outcomes to be assessed (Please tick as appropriate)</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>1. Written tests</td>
<td>30</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2. Quiz</td>
<td>15</td>
<td>✓</td>
<td></td>
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<tr>
<td>3. Individual written assignment</td>
<td>15</td>
<td>✓</td>
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<tr>
<td>4. Group project presentation</td>
<td>20</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>5. Group project report</td>
<td>20</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Total</td>
<td>100 %</td>
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Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

1. Written tests will be separated into two parts: PPE ensemble (15%) and masks (15%), which will be completed after relevant lectures, respectively.
3. Group project presentation and Group project report: based on a mini group project related to the evaluation of PPE.

<table>
<thead>
<tr>
<th>Student Study Effort Expected</th>
<th>Class contact:</th>
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<tbody>
<tr>
<td></td>
<td>Lecture</td>
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<tr>
<td></td>
<td>Seminar / Tutorials/Presentations</td>
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### Other student study effort:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Reading / Self-studying</td>
<td>25 Hrs.</td>
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<tr>
<td>Seminar preparation</td>
<td>25 Hrs.</td>
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<tr>
<td>Individual written assignment</td>
<td>25 Hrs.</td>
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<tr>
<td>Group project</td>
<td>25 Hrs.</td>
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<tr>
<td><strong>Total student study effort</strong></td>
<td>142 Hrs.</td>
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### Reading List and References

<table>
<thead>
<tr>
<th>Journal</th>
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<tbody>
<tr>
<td>The New England Journal of Medicine</td>
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<tr>
<td>The Lancet</td>
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<tr>
<td>American Journal of Infection Control</td>
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<tr>
<td>Emerging Infectious Diseases</td>
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<tr>
<td>Journal of Emergency Nursing</td>
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<tr>
<td>Infection Control and Hospital Epidemiology</td>
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<tr>
<td>Ergonomics</td>
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<tr>
<td>European Journal of Applied Physiology</td>
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<tr>
<td>American Journal of Industrial Medicine</td>
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<tr>
<td>Textile Research Journal</td>
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### Essential and supplementary reading list:


Revised on 24 May 2011