Subject Description Form

Subject Code	ABCT3391
Subject Title	Ecology and Ecosystem
Credit Value	3
Level	3
Pre-requisite	CSE29371 Environmental Chemistry
Objectives	The subject explains basic principles and concepts of ecosystem ecology. The relationships between organisms and the environment will be taught. Apart from the biotic-abiotic interactions, students will learn about the human-induced changes in ecosystems, analytical skills to address environmental problems and possible remediation methods.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. know the diversity of ecosystems in the world; b. better understand the physicochemical and biological structures of characteristic ecosystems; c. aware of the severity of environmental deterioration; d. define ecology and different levels of biological organization; e. describe trophic levels and the fate of energy as it passes from one level to another; and f. apply their knowledge of ecology and environmental science to improve the quality of life in the individual context and as citizens in a global village.
Subject Synopsis/ Indicative Syllabus	1. <u>Concepts of ecology</u> Evolution; natural selection; biodiversity; extinction and speciation; levels of biological organization 2. <u>Communities and ecosystems</u> Physical environments; organism interactions; ecosystem functions and services; characteristics of key ecosystems 3. <u>Environmental mechanisms</u> The water cycle; trophic transfer of energy; production and decomposition; nutrient cycling 4. <u>Ecological monitoring and conservation</u> Anthropogenic stress; environmental deterioration; ecological restoration; ecological assessment methods
Teaching/Learning Methodology	Lecture notes, scientific papers and other teaching tools such as newspaper and magazine clippings will be used in the lectures. Students will study and discuss problem sets and present their insights in the tutorials. Reference materials will be distributed in class or obtained from the library or internet. If possible, a field trip will be organized for students to experience the ecology of Hong Kong.

<table>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td></tr>
<tr><td>1. Group project</td><td>30%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td><td>✓</td></tr>
<tr><td>2. Individual essay</td><td>30%</td><td></td><td></td><td></td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>3. Examination</td><td>40%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
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Students’ understanding of ecology and ecosystems will be assessed in the examination. Students will work as a team in a group project on a current ecological or environmental issue and present their findings as well as suggested solutions. Students are required to complete an individual essay on a specified topic in ecology provided by the lecturer.
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<tr><td>Student Study Effort Required</td><td>
<table>
<tr><td>Class contact:
● Lecture
● Tutorial</td><td>
26 hours
13 hours</td></tr>
<tr><td>Other study effort:
● Group project, essay writing and self-study (and a field trip, if any)</td><td>
81 hours</td></tr>
<tr><td>Total study effort:</td><td>120 hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>

Smith TM and Smith RL (2015) Elements of Ecology, 9th ed. Pearson. QH541.S62 2015
Botkin DB and Keller EA (2014) Environmental Science: Earth as a Living Planet, 9th ed. Wiley. GE105.B68 2014
Stiling PD (2002) Ecology: theories and applications, 4th ed. Prentice Hall. QH541 .S675 2002

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