UNIVERSITY COLLEGE LONDON

University of London

EXAMINATION FOR INTERNAL STUDENTS

For The Following Qualifications:–

Eng.D. *M.Sc.*

ESGV8: Space, Form, Behaviour and Its Production

COURSE CODE	:	**ENVSGV08**
DATE	:	**10–MAY–05**
TIME	:	**14.30**
TIME ALLOWED	:	**2 Hours**

TURN OVER

ESGV8 SPACE, FORM, BEHAVIOUR AND ITS PRODUCTION (2 hours)

Candidates must answer THREE questions from the list of NINE questions below.

1.
   a) Discuss how shape grammars may be used to imitate building styles or the designs of specific architects. Demonstrate the process with an illustrative grammar. (22 marks)
   b) What are the limitations of shape grammars for creative design? (11 marks)

2.
   a) Explain what the term 'fractal' means, illustrating your answer with some examples of fractal patterns from the natural world. (22 marks)
   b) How could you use an L-system to make a fractal structure? (11 marks)

3.
   a) Describe the operation of a Jacquard loom. (22 marks)
   b) To what extent does the loom represent a formal computer language for pattern generation? (11 marks)

4. The ability to produce complex behaviour from simple rules is often called emergence.
   a) Describe an emergent system, such as the flocking (boids) algorithm originally implemented by Craig Reynolds. (22 marks)
   b) Discuss how such a system might be extended to simulate movement of ONE of the following:
      i) pedestrians OR
      ii) fish OR
      iii) vehicular traffic (11 marks)

5.
   a) Discuss how space syntax can be used to model pedestrian movement in urban systems. (22 marks)
   b) How might the rules of space syntax be reversed to create form rather than analyse it? (11 marks)

6. How would you design a fitness function for an evolutionary design tool? In your answer, discuss the advantages and drawbacks of different possibilities. (33 marks)

7. Discuss the strategies you would use to define parametric relationships in models of ALL THREE of the following building categories:
   a) An arched roof structure (11 marks)
   b) An exposed concrete framed structure (11 marks)
   c) A pedestrian foot bridge (11 marks)

CONTINUED OVERLEAF

8.

a) How can machine learning be used to aid structural design?

(22 marks)

b) Briefly compare and contrast the use of support vector machines and neural networks to do so.

(11 marks)

9.

a) How can the narrative of space be altered through locative and pervasive computing?

(22 marks)

b) Is the result novel or is it simply a rehashing of existing architectural theory?

(11 marks)

Total 99 marks for paper

END OF PAPER