

National University of Ireland, Galway  
OLLSCOIL NA hÉIREANN, GAILLIMH

SUMMER EXAMINATIONS 1999

First Science Examination

**Earth Sciences, ES101**

Professor B.P.J. Williams  
Professor A. Brock  
Professor M. Orren  
Professor P. Ryan

Time allowed : Three hours

Answer five questions. Question 1 is compulsory and must be answered on the accompanying sheet. The remaining four questions should be selected from Question 2 to Question 7 and answered in the Answer Book.

Question 1 carries about twice the weight of the other questions. You should therefore spend between 60 and 80 minutes answering it, leaving between 25 and 30 minutes for each of the remaining four questions.

1. This Question is compulsory. Answer it on the accompanying sheet. Write your name and number on the sheet, and include it with your Answer Book at the end of the examination.
2. Sketch the general shape of the global travel time curves for P and S waves for epicentral distances from  $0^\circ$  to  $180^\circ$ .  
Outline how it is possible to deduce the gross structure from these curves, and give a brief description of the main divisions so found.
3. Compare and contrast continental and oceanic crust.
4. Write an essay on either how mountain belts occur or how sedimentary basins occur.

5. Answer briefly all the following, including sketches and diagrams where appropriate:
- (a) Explain the differences between body fossils, trace fossils and chemical fossils giving examples of each type.
  - (b) Explain why all organisms do not have a similar fossilisation potential.
  - (c) What is "the *Isuasphaera* problem"?
  - (d) What are the main lines of evidence for the impact of an extra-terrestrial body with the Earth at the Cretaceous-Tertiary boundary?
6. Describe the principle features of the large scale surface ocean circulation.
7. Discuss why Ireland might have considerable oil reserves.