

Short Answer Essay Techniques

28 September 2023

Taking attendance

BA-XJ-JL

How is this module going so far?



BIOU3GE: Evolution
and Genetics

UNIVERSITY of
STIRLING 

- ▶ Are the learning materials clear?
- ▶ Do you know what you need to do each week?
- ▶ Are you managing your time and keeping up?
- ▶ Any other suggestions?

Why do we have this lecture on short answer essays?

- ▶ Help you prepare for assignments, all of which will require some writing
 - 1. Short answer essay plan (0%)
 - 2. Population genetics assignment (25%)
 - 3. Phylogenetics lab report (25%)
 - 4. Short Answer Essay Journal Portfolio (50%)

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 2. Population genetics assignment (25%)
 3. Phylogenetics lab report (25%)
 4. Short Answer Essay Journal Portfolio (50%)
- ▶ Explain what a short answer essay is and how to prepare one
- ▶ Explain the formative short answer essay planning assignment

Short answer essay journal portfolio

- ▶ Introduced in response to student comments
- ▶ Replaces the traditional 4 hour exam setting

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- ▶ Expected word count 500 (\pm 100)
- ▶ Expected references 2-6
- ▶ Rubric available [on Canvas](#)

Question 1 from last year

Short answer essay Question 1: please choose to answer one of the following:

1. Natural selection tends to reduce genetic variation within a population by disfavouring particular alleles. However, in some situations, selection can help maintain genetic variation rather than erode it. Using two examples, explain how natural selection can maintain genetic variation in a population.
2. Conservation managers often try to purchase corridors of undeveloped habitat so that larger preserved areas are linked into networks. From a population genetics perspective, what are the predicted effects of such corridors, and how might they positively or negatively affect conservation success?

Again, please only choose one. If you answer more than one, only the first one will be graded.

Use of generative texts such as ChatGPT

1. Cannot use ChatGPT
2. Must be your own writing
3. University Guidance
4. It makes stuff up

Short answer essay technique

1. What is a Short Answer Essay?
2. How to prepare your answers
3. The essay planning assignment
4. Questions and Answers

What is a short answer essay?

An extended written answer to a **specific** question

- ▶ Approximately 500 words
- ▶ Usually 1-3 paragraphs
- ▶ References not included in word count



The short answer essay format is used in all assignments and the exam (short answer essay journal portfolio)

What we look for when marking

- ▶ Demonstrates a clear understanding of the topic and aim of the essay (its context & significance)
- ▶ Logical progression of ideas such that conclusions are clearly justified from the evidence presented
- ▶ Answers are comprehensive and correct
- ▶ Use of relevant references to the scientific literature
- ▶ Clear and concise scientific writing
- ▶ Interesting and relevant examples (if applicable)

Example short answer essay question

“In *Improbable Destinies*, Losos describes convergent evolution and also discusses cases where convergence does not appear to have happened (e.g. Chapter 3). Describe why convergent evolution does not always occur.”

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3. **Summarise your notes** from step 2 and organise them to synthesise what you have learned
4. **Make an essay plan** structuring your answer as a series of ordered bullet points

How to approach short answer essay questions

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8. **Proofread** your short answer essay for grammar and spelling

Recommended structure for a short answer essay

Introduction

- ▶ Demonstrate that you understand the question
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Conclusion

- ▶ Summarise the conclusion answering the question

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Introduction

- ▶ Definition of convergent evolution
- ▶ Brief example of nectar feeding birds to help explain context
- ▶ Evolution does not always produce convergence for 3 reasons

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Body

- ▶ Unique environments (e.g. eucalyptus forest produces koalas)
- ▶ Multiple solutions: phenotypes (e.g. rats dig with teeth or claws) or functions (e.g. run or hide to evade predation).
- ▶ Different ancestral phenotype (e.g. whales swim with 'legs', penguins swim with wings)

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Conclusion

- ▶ Several reasons for non convergence
- ▶ Especially for rare environments, challenges solvable in different ways and unrelated species

Scientific writing style

- ▶ Be clear & concise
- ▶ Logical flow between sentences & sections
- ▶ Formal style (not too personal)
- ▶ **Read scientific paper abstracts to develop a feel for scientific writing**

The formative (ungraded) assignment

Read “Killing the behavioral zombie: genes, evolution, and why behavior isn’t special” (Zuk and Spencer 2020)

Produce a short answer essay **plan** (not a whole essay) for:

What are some reasons that the nature versus nurture distinction is a misleading way to think about evolved behaviours?

Submit on Canvas by 06 OCT 2023 (23:59 UK time)

Full details in assignments

¹Zuk, M., & Spencer, H. G. (2020). Killing the behavioral zombie: genes, evolution, and why behavior isn’t special. BioScience, 70(6), 515-520. [\[Link\]](#)

The formative (ungraded) assignment

The nature–nurture controversy seems to be a scientific zombie, an idea that will not die despite ample evidence that it is inaccurate and even damaging to our ideas about how characteristics evolve. The dilemma is particularly clear with regard to behavioral traits, such as intelligence or sexual orientation, where thinking that genes or the environment predominate can lead to flawed conclusions. We argue that, first, behavior is not special in its evolution but evolves in the same manner as other traits. Second, no trait, whether behavioral or otherwise, is caused by either genes or the environment or even by an additive combination of the two; the interaction is the important feature. Third, genes do not and cannot code for behavior or any other characteristic.

¹Zuk, M., & Spencer, H. G. (2020). Killing the behavioral zombie: genes, evolution, and why behavior isn't special. BioScience, 70(6), 515-520. [\[Link\]](#)

Example short answer essay plan

Read Chapter 1 'What is Evolution?' of 'Why Evolution is True' (available online through the Reading List). Based on the arguments presented in that chapter, produce a short answer essay plan for the following question:

Produce a short answer essay **plan** (not a whole essay) for:

What is some of the important evidence for the theory that life on earth has arisen through Darwinian evolution rather than conscious design?

Your essay plan should be produced as a bullet point list, with each bullet containing sentences or notes to clearly outline the structure and content of the essay answer you would produce for the assignment question. It should outline the main arguments, examples and references you would use in your answer.

Example short answer essay plan

Introduction

- ▶ Introduce that two theories that might explain life on earth (Darwinian evolution versus intelligent design)
- ▶ Define Darwinian evolution and intelligent design; emphasise the contrast (Coyne 2010)
- ▶ State the aim of the essay is to provide evidence in support of Darwinian evolution

Body Paragraph 1

- ▶ Evidence for speciation supports Darwinian evolution
- ▶ Case study of Darwin's finches (Grant & Grant 2022)
- ▶ Explain why example supports Darwinian evolution but not intelligent design

Body Paragraph 2

- ▶ Homologies among species supports a common ancestor of life
- ▶ Example of genetic changes showing common ancestor of all eukaryotes (Chernikova et al. 2011)
- ▶ Explain why genetic similarity predicted by Darwinian evolution but not intelligent design

Conclusion

- ▶ Summarise that observations from Biogeography and supports Darwinian evolution but not intelligent design
- ▶ Conclusion that life on earth has arisen through Darwinian evolution

References

- ▶ Chernikova, D, et al. (2011). Biol Direct. 6:1-18.
- ▶ Coyne, J. A. (2010). Why evolution is true. Oxford University Press.
- ▶ Grant, P. R., & Grant, B. R. (2002). Am Sci, 90:130–139.