

**NEWNHAM COLLEGE**  
**CAMBRIDGE CB3 9DF**

**The Newnham Engineering Prize 2019-20**

The Newnham Engineering Prize is open to all **girls currently in Year 12** (Lower Sixth) at a UK school. The prize may be of particular interest to those studying Physics, Mathematics, Further Mathematics, Chemistry, Biology, Design and Technology or Economics, but we welcome entries from interested students studying any combination of subjects.

Entrants are invited to submit an essay on **one** of the topics overleaf. You can write broadly about the topic, or you can choose to go into greater detail on a specific aspect. Some ideas are given under each topic area to help you to start thinking, but feel free to explore the topics and choose your own examples to discuss.

The essay should be 2000-2500 words in length including footnotes and figure captions, but lists of references and bibliography can be additional to this. All sources must be appropriately acknowledged and cited and the bibliography should include websites that you have consulted. Up to **five** entries may be submitted per school.

There is no rigid requirement for the structure and format of the essays, but good submissions will present clear arguments, include illustrations (which might be graphs, plots and diagrams as well as pictures), and where possible provide some specific examples or cases. A good level of technical content is expected, but you should aim to make the essay interesting and accessible to an intelligent non-specialist audience.

Each of the Newnham Essay Prizes has a first prize of £400, a second prize of £200, and third prize of £100.

Entrants should upload their submissions to the webform, found here:

<http://www.newn.cam.ac.uk/admissions/undergraduates/newnham-essay-prizes/>

The **cover sheet** should also be uploaded to this webform. Please ensure that a school/college representative has completed the appropriate section. Entries will not be valid without this information.

The deadline for receipt is **12pm on Friday 6<sup>th</sup> March 2020**. For any queries not answered here, please contact Lucy Rogers (Schools Liaison & Outreach Officer) by email at slo@newn.cam.ac.uk or by telephone on 01223 330471.

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**The Newnham Engineering Prize Questions: 2019-20**

**1. What can engineers do to mitigate climate change?**

Atmospheric levels of CO<sub>2</sub> are increasing and the world is waking up to the problem of climate change brought about by human-generated greenhouse gas emissions. As engineers, we have the skills and expertise to make a difference, providing technological solutions to reduce global carbon emissions. All engineering disciplines have a role to play, and some areas are suggested below.

- (a) Electric Power Generation and consumption.** What are ‘renewable sources’ of electric power generation? How do they work and what are their strengths and limitations? Are there any new sources being researched and developed that might provide solutions for the future? Could the UK generate all its electricity from renewable sources?

How can we reduce our demand for electric power so that we don’t need to generate so much? There may be opportunities in both domestic and commercial/industrial consumption, e.g. energy-efficient homes, energy-efficient manufacturing, low power consumer electronics.

- (b) Buildings.** New buildings are energy-intensive to build and in particular they normally use a lot of cement which is one of the biggest sources of carbon emissions globally. What are the alternatives?
- (c) Transport.** Modern lifestyles involve a lot of transport, of people as well as goods. How energy-efficient are different modes of transport, and what is the potential for reducing their carbon footprint?
- (d) Other engineering areas.** Technological solutions can be found in all engineering disciplines. You are encouraged to choose for the topic of your essay an example that interests you.

**2. Engineering in medicine, healthcare and bioengineering**

Technological developments are transforming medical practices in all kinds of ways. We are developing new techniques, new equipment and devices, new ways of processing and assessing data, and we are creating, and even growing, new materials. Write an essay on some aspect of how medicine is benefiting from engineering and technology.