

## **Sustainable Projects Fund Application Form 2012-2013**

**Applications should be sent to [sustainable.futures.lse@gmail.com](mailto:sustainable.futures.lse@gmail.com) no later than 11:59pm on the 30th January, 2013.**

Name(s): David Scott. In addition, Tugkan Batu, Jackie Everid, Rebecca Lumb, Mathieu Dubois, James Ward, James Abdey.

Programme/Position: Mathematics Departmental Manager. Tugkan, Jackie, Rebecca and Mathieu are on the Mathematics Green Impact Team, James Ward is the MA107 course lecturer, James Abdey lectures both ST102 and ST107.

Department: Mathematics, leading, and Statistics.

Project Title: **To introduce sustainability into the curriculum of selected large Mathematics and Statistics courses**

1. Project description (500 words max):

Broadly, this project aims to introduce environmental sustainability into some of the largest Mathematics and Statistics course modules, to better ensure that students in these two departments, and across LSE, become more aware of, and knowledgeable about, the importance of sustainability.

The courses in question are: MA100 Mathematical Methods (approx. 550 students), MA107 Quantitative Methods (Mathematics) (approx. 330 students), ST102 Elementary Statistical Theory (approx. 500 students), ST107 Quantitative Methods (Statistics) (approx. 330 students).

The reason we will focus on these courses initially is that they have the greatest reach, due to their size. Students on MA100 cannot take MA107 (and vice versa), and students on ST102 cannot take ST107. This means the project has the potential to reach around 900 students a year, the majority of them first year undergraduates on quantitative degrees where green issues and sustainability are rarely discussed. Most students on MA100 also take ST102 and most students on MA107 also take ST107, so by utilizing courses offered by both departments, there is a greater opportunity to embed the green concepts covered.

Mathematics and statistics as subjects do not easily lend themselves to consideration of issues relating to sustainability. These are highly theoretical courses, with few 'real world' or 'empirical' examples and applications. As such, we are aware that there are limits to what we can hope to achieve, and that some of the changes made may be quite cosmetic. Research will need to be undertaken into what green concepts might best demonstrate the relevant mathematics (for instance, carbon trading, offsetting costs, green taxes, statistical modeling of climate change) and how these might be introduced without reducing students' focus on the mathematics and statistics they need to learn. However, the very fact of mentioning environmental concepts on a regular basis, even if superficially, will hopefully help embed the importance of these matters into the minds of the students and raise their awareness and understanding of them.

The lecturers of MA107 (James Ward), ST102 and ST107 (both James Abdey), are willing to undertake this work themselves, in return for payment. On MA100, we are likely to ask one or more GTAs to undertake the work – Mathieu Dubois (Mathematics PhD student, Green Impact team member and MA100 teacher has already expressed an interest). Some of the work may simply involve the inclusion of additional non-mathematical 'green' phrases in the materials where appropriate.

We are also requesting funds to run a competition on each course where the students themselves are asked to identify potential applications of the mathematics and statistics they've learnt to green or environmental situations, or contexts – in itself, a further means of raising student awareness of green issues, as well as hopefully reducing the research time and therefore overall cost of the project.

The work here may, in turn, lend itself to use in other courses too.

2. Explain how you think that this would be of environmental and social benefit (500 words max; please note the areas for specific consideration, as listed under Aims and Guidelines; supporting evidence may be requested):

With reference to the Aims and Guidelines of the SPF, this project falls primarily under the aim of 'education and awareness', and also under the aim to improve engagement of the LSE community with sustainability issues.

By gently and regularly reminding students about a variety of green issues and ideas, in a context where they might not expect to find these mentioned, and connecting these with some concrete scientific theory, we would hope to educate students on the importance of these matters, and raise their awareness and understanding of them. This in turn will hopefully more forcefully embed these ideas in their minds when they leave LSE.

Whilst it is good and admirable that a department such as Mathematics can perform well in the Green Impact initiative, reducing its environmental impact through a variety of good practices, the far greater success would be if we could find a way to ensure that our own students, and students from other departments who take our courses, leave LSE with a better understanding of the importance of environmental sustainability; of reducing their own environmental footprints in their future lives, and in the places where they go on to work.

LSE students are high achievers and have high aspirations – the term 'future leaders' is often coined to describe them. If they leave LSE willing and able to lead (whether it be in business, finance, politics or elsewhere) on environmental sustainability, then we will have achieved far more than we currently do by minimising the impact of a relatively small number of staff.

3. Total Financing Requested: **£3,085 (though of necessity this is a rough estimate)**

4. Itemized Budget estimating precisely how funds will be spent:

What?	How Much?	Explain Use
MA100 course development	15 hours, plus on-costs = approx. £340	Payment to GTA/Guest Teacher to re-develop materials to incorporate real-world environmental and related examples and contexts for the mathematics being taught. This would be from Band 5 on the hourly-pay scale.
MA107 course development	15 hours, plus on-costs = approx. £515	Payment to Course Lecturer to re-develop materials to incorporate real-world environmental and related examples and contexts for the mathematics being taught. The payment is higher because the lecturer is on Band 7.
ST102 course development	15 hours, plus on-costs = approx. £515	Payment to Course Lecturer to re-develop materials to incorporate real-world environmental and related examples and contexts for the mathematics being taught. The payment is higher because the lecturer is on Band 7.
ST107 course development	15 hours, plus on-costs = approx. £515	Payment to Course Lecturer to re-develop materials to incorporate real-world environmental and related examples and contexts for the mathematics being taught. The payment is higher because the lecturer is on Band 7.
Competition Prizes	4 x £300 = £1,200	To fund prizes for student competitions on each of the four courses mentioned to identify potential applications of the mathematics and statistics they've learnt to green or environmental situations, or contexts. Probably 1 <sup>st</sup> prize of £200, 2 <sup>nd</sup> prize of £100, or green goodies (organic chocolate etc) to that value. If the committee judges that these prize values are a little high, we would be happy to work with what they deem to be appropriate. Bigger prizes probably better given as cash/vouchers, smaller prizes perhaps better given as 'goodies'.

5. Non-Financial Resources needed for project completion (i.e. volunteers, tables, etc; please also detail how you plan to acquire these resources):

What?	How will it be acquired?	Explain Use
Administrative time and input	Provided by David Scott, possibly by others in Mathematics on the Green Impact team	As bid leader, and a full-time LSE employee, I am more than happy to contribute my time to the project for free. I will be involved in running the competition element, arranging payments to those getting paid, and contributing ideas, research, concepts and phrases/sentences to the re-development of the course materials.

6. Project Completion Timeline (please note that projects winners will be announced in the first few weeks of February):

If we are successful with our bid, we would aim to run the competition element of this during Lent or Summer term.

The development work on the courses would be intended to take place during the summer vacation, with the aim of completing this in time for the start of the new academic year in October 2013. That cohort of students would be the first to receive the revised materials.

7. What obstacles to completing your project, if any, do you anticipate, and how will you try and solve or circumvent them?

Having discussed this project with colleagues, I am aware that the opportunities for incorporating environmental sustainability into these courses are limited. My academic colleagues obviously understand the mathematics, but not necessarily much about environmental sustainability and how this might, realistically, be included in their courses. My lack of mathematical background hinders me in helping them, despite having some knowledge of environmental matters. Therefore, none of us knows yet how realistic it is to say that we will find a good number of proper green 'examples' that genuinely complement the mathematics in each course, rather than detracting from it. The focus must remain on ensuring that the students understand the mathematics and statistics they are being taught. Nevertheless, if only at a relatively superficial level, we believe that it will be possible to ensure that examples of, or references to, environmental sustainability appear regularly during each course.

8. Any other considerations you consider relevant:

The funds requested are, to a degree, notional. The more money awarded, the more time can be spent researching and developing ways of incorporating sustainability into the curriculum of these courses, however indirectly in some cases. Those involved are not, by training, overly knowledgeable about the connections that might be drawn between mathematical and statistical theory, and environmental sustainability. The amounts requested are, therefore, probably on the low side, in part to ensure that expectations of what we might achieve at the first attempt are also realistic. We might hope to make a further bid next year if our bid is successful this year, to either develop these courses further, or bring this approach to other large courses taught by Mathematics, and potentially by Statistics.

Signature of Applicant(s):



David Scott

Date: 30 January 2013

(Signing here indicates agreement to the 2012-2012 Sustainable Projects Fund Rules, Guidelines,  
and Evaluation Criteria)