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| **Teaching Programme** | **Earth and Planetary Science** |
| **Date due** | **w/c 11/1/2021** |

Please complete this form to tell us about your future plans for your Teaching Programme. You are asked to complete a 1 page strategic three-year plan for the programme and also to detail your plans for infrastructure and technical support, highlighting areas where investment is required, what academic hires would help to deliver your strategy, and outline your expected student recruitment over the next year.

**Strategic Teaching Plan for next 3 years 2021-2023**

*Please provide a one page strategic plan for your area outlining the following:*

* *Likely long-term directions which may require addressing through academic hires/infrastructure*

One of the main strengths of this programme is its breadth, as well as the inherent flexibility for students to choose any of six distinct pathways. In addition to nurturing and protecting that breadth, there is scope to amplify and better equip our students’ skill sets by bringing more data science and digital modelling of geological features into our curriculum. Enhancing their digital geospatial skills should be a priority as it directly feeds into their employability and career versatility. None of this means that digital geoscience training is a replacement for fieldwork; rather that we should integrate both of these things so that each strengthens the other. Arguably, there is no greater trait that we can equip our graduates with than to train them in integrated 3D process-based thinking, with the highly complementary ability to be able to handle large and diverse datasets and computer models. These considerations directly translate into the need for a specialist academic hire in the area of geospatial data science and/or further IT/infrastructure support.

* *main goals and targets to be achieved.*

The Earth and Planetary Science Programme of the new degrees in EES have not completed their first full cycle yet, and so the most important ‘goal’ of the next two years or so needs to be giving the constituent pathways space to mature and bed in. That can and should be achieved in tandem with growing student numbers, but significant changes to existing pathways/units delivered should not be a priority at this point (i.e., next 2 years). That being said, any opportunities for strengthening our provision of geospatial skills (e.g., GIS, modelling) through appropriate minor programme changes (within units, on fieldcourses) should be taken. The ambition will be to streamline these areas within our existing teaching (which we have not always done effectively), and then expand. The provision of geospatial skills will be one of the most important criteria on which accreditation of our new programme by the Geological Society of London, which we aim to secure this year (2021), will be judged. A significant gap in our teaching expertise remains in the area of quantitative geomorphology. A suitable academic appointment in this area would bring exciting potential to broaden and enrich the programme (as well as potentially solving some issues and creating some new opportunities; see comments below with respect to the Geology-Physical Geography pathway).

* *current activities that will grow or reduce, and implications for departmental workload*

An important (as yet unrealised) implication of the new degree structure is that there will be more 3rd Year lab-based projects drawing on our instrumentation and technical support. Mapping projects (which traditionally don’t have a significant lab component) will likely remain popular, but all of the other 5 pathways will involve 30 credit projects that will rely on our laboratory and computer facilities – this will certainly translate into an ever increasing demand on resource as student numbers grow.

* *future development of the course and recruitment risks / opportunities*

The scientific areas covered in our teaching equip our students with the knowledge and skills to address present day issues like climate change and natural hazards after they graduate. There is also the question of sustainable resource geology in support of the energy transition. Integration with and preparation for various M-level courses should be considered with respect to the latter areas. In the current economic climate, projections are for a large employment market in resource geology in the coming years, so this needs to be considered for our undergraduate teaching too, but also needs to dovetail with environmental and societal forces at play so that we are seen to be training scientists with the skills required to balance resource requirements with environmental considerations. Considering how we make optional units in relevant subject areas across the traditional E+P – EnvSci divide available to students on either programme, and further still supporting new the development of new units that allow this holistic perspective to be imparted to our students, are worthwhile ambitions with respect to future course development in the medium-long term.

* *interactions with other departments, faculties*

The main area of overlap with another Dept on this programme is the Geology with Physical Geography pathway (SEED). Challenges have persisted (from an earlier incarnation of this joint venture) with timetabling and differences in the culture of project supervision and teaching. There is no doubt the pathway is attractive to students, so if in DEES we were in a position to broaden scope of project topics and some taught units, a wholly DEES-hosted ‘Earth Science’ pathway might be a more fluent option (in medium term, 3+ years). This would also require consideration of a new academic hire in the field of geomorphology (as lecturer Brocklehurst who previously fitted that role has not been replaced).

* *brief reflection on impacts to UN Sustainability goals and CO2 footprint*

Stressing the role that Earth/Planetary sciences have in reaching these goals (as we already do) is a good idea. Appreciation of CO2 footprint could be further developed via in diverse course exercises (e.g., from calculations for mining or drilling operations to estimating the CO2 footprint of producing their dissertation). There are also some implications here for overseas field activities (courses, mapping) having a high CO2 footprint, but it is difficult (not impossible) to countenance not running these as they (in normal years) contribute substantially to the quality of our students experience. The single most common answer when Manchester geology/geoscience graduates are asked what they liked most about their degree is invariably the fieldwork provision!

*Please provide evidence to support the aspirations and how new developments will be realised. It is important that you consider the staff, technical support and infrastructure resources that will be necessary to deliver any increase in activity and to justify these in your plan.*

* ***Whats gone well/less well?***

The answer to this resembles two sides of the same coin. The pandemic has brought out the absolute best in us in terms of the efforts across the teaching team to support our students and give them the best quality learning experience possible. Issues that have arisen are likewise due to the restrictions we are being forced to operate under. Towards the end of last semester, students were struggling in terms of stress and mental health. Some are desperately worried about fieldwork provision and solutions we had begun to develop in mid-December will now have to be shelved given the increased rates of Covid transmission. Some pre-existing issues relating to collaborative teaching with non-DEES parts of the university (see above) have been exacerbated by the Covid restrictions.

**Outline how you will use university/department infrastructure and technical support in the next year, highlighting where any investment is required**

The recent collation of DEES technical requirements for project-related and other teaching constitutes a strong evidence base for our support requirements. First and foremost, teaching across the whole programme requires the production of good quality thin sections. The current situation where we do not have any technical support in the thin section-making facility is not sustainable and we will start to see consequent negative impacts on our teaching early in the academic year 2021-22. However, thin section making requires a high skill level and training, so to have a person in place that is able to do the required work later in 2021 would need them to be appointed now, or in the next month or two at latest. The XRF facility, which has regularly been used for project work in recent years, is currently not available and this will also negatively impact our project provision if not back up and running by summer 2021. Other, probably increased, laboratory and computer support for projects in the planetary, geochemistry, resources and palaeobiology pathways will be required if and when student numbers grow, as already outlined further above.

A medium term goal, in line with and supporting some of the aspirations expressed above, should be the investment in and development of a new teaching microscopy laboratory in DEES, with a network of connected wifi-enabled binocular microscopes that can link to a laboratory central system and also to the students’ iPads, iPhones etc. Some of our students still learn using monocular microscopes that are far from the best example of 21st Century geoscience teaching provision and are below the standard of many of our competitors. A digital microscope classroom would not just enhance student learning and experience, but could help us to better develop our teaching and also be a powerful recruitment tool.

**Outline any upcoming staffing changes or gaps and opportunities (eg fellows) to achieve strategic goals or maintain existing strengths**

Discussed above really, but worth emphasising that, considering the fellows coming through at the moment, there is a concentration of expertise in volcanology/petrology/geochemistry that could potentially be exploited to leverage an M-level course in this broad area (to rival those at U of Bristol, UCL or Lancaster). The planetary science area has lost IL through retirement and though there are also some fellows coming through there, we are in a situation where the planetary pathway lead is not a planetary scientist which is not optimal.

**Student recruitment**

Please estimate how the maximum capacity of your programme in AY21/22, and what strategies you have in place to maximise quality/size of cohort, and employability of graduates. This plan should be developed with the Admissions Tutor Rhian Jones.

There is room on the Earth and Planetary Programme to grow student numbers particularly on the Geochemistry and Palaeobiology pathways. Some time and and space is needed for these pathways to do this.

**Graduate employability**

Please outline any changes planned to improve the employability of graduates, discussing with the employability committee chair, Luis Garcia Carreras.

It is not clear that the central careers service offer students as much support as they needed. Although there is some bespoke subject-specific support offered in a small number of 2nd Year tutorials, this could (and should) probably be enhanced further.