|  |  |
| --- | --- |
| **Teaching Programme** | **MSc Petroleum Geoscience** |
| **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:** Plans are being discussed to merge the MSc Pet. Geo. for Exploration and MSc Pet. Geo. for Reservoir Development and Production programmes (reverting to our previous course structure) to offer a single programme, MSc Petroleum Geoscience. This will retain options within it to specialise in Exploration, Development or CCS. Course merger will reduce workloads by rationalising course delivery. Many modules on this programme will also be co-taught with the new Subsurface Energy Engineering MEng (jointly with CEAS) and with our proposed new MSc course in Subsurface Sustainable Geoscience (pending NPP approval) and both anticipated to start in 2021, offering significant synergy. We also look to continue to strengthen input of teaching materials on mitigation, such as CCS, and increased focus on gas utilisation, in line with current industry activities and the UK Net Zero strategy.

**Infrastructure:** We plan to maintain and continually update our high performance computing cluster, which is the main infrastructure requirement. Departmental IT support for this is also critical to course delivery and student satisfaction.

**Staffing:** The program will gain input from the appointment of Prof Chris Jackson, who brings his work and teaching experience (having taught on the Imperial College Petroleum MSc). We have a temporary reduced capability, due to the 2 year agreed leave of absence for Dr Dave Hodgetts, as his post was not backfilled by the Dept. His specialist skills in subsurface modelling are a key component on both our MSc programme and required in the new joint MEng course. This is currently being covered by external support and academics in related fields, but should Dr Hodgetts not return, a longer term solution and replacement is required.

There is an increasing requirement for taught courses in AI/Machine Learning and GIS (on all MSc programmes and we would suggest also as an option on the Undergraduate programme), for which the Department has not been able to identify an academic. Recruitment of a geostatistical modeller with advance computing experience would be of benefit to MSc Pet. Geo, MSc Sustainable Energy and more widely within the department. Departmental IT support is also critical to course delivery and student satisfaction, to maintain bespoke computing programmes, load data and run the high performance workstations. This also critical where remote access is being used.

We have continued with the significant reduction in external teaching provision on the course, to meet budget requirement. Since 2018 input has reduced from 9 external teachers to an anticipated 3 in 2021/2, a reduction of over 75% cost. Based on input from our Industrial Liaison panel and student feedback, we strongly advocate the need for applied external tuition on this premium fee course. It allows the course to improve the employability of graduates, maintain industrial relevance and gives student experience of real time activities and processes. It is also a very positive marketing tool. In 2021/22 external tuition is planned to include: Jim Armstrong (Applied organic geochemistry: 4 days), Leigh Wharton (Business skills: 5 days), Schlumberger (Reservoir modelling: 4 days), Alun Griffiths (Reservoir Development: 6 days), plus other externals at expenses only for guest lecturing (5 days).

**Student employment and recruitment:** The applied MSc programme has a strong international reputation (evidenced from the wide international intake) and is highly regarded by industry. Over 75% employability within the 1st year (2012-2018 - 62% employed in geoscience / PhD, and 14% in other sectors). This has recently been subject to market variation and impacted by the Coronavirus epidemic). We note that Energy companies have announced significant investment in CCS in the UK / globally for which our graduates would be a future target. We constantly monitor the job market and course changes reflect changing employer demand on skills. The Energy sector remains the largest employer of geoscientists globally and predictions are for a future increase in employment opportunities in Energy companies, building from low numbers as they have downsized and shed older staff over the last 4 years.

Student numbers remain close to target, although reduced from the pre 2018 highs, due to a current economic and global hydrocarbon price fall, also impacted by Coronavirus and depressed economic activity. We anticipate maintaining a stable level at 20-25 in 2021/2, increasing again to 30-50 as the economy revives. Our student profile shows a very healthy international intake, from a wide range of countries. UK application have fallen, in common with all energy related MSc programmes in the UK, reflecting student perception and market. Initiatives such as the UK Energy Transition Centre for Masters Training (which involves the majority of UK Universities and global energy companies), an initiative led and supported by the University of Manchester, are designed to reverse this trend. The introduction co-taught units across the Energy related Masters programs in the department will result in taught modules having increased student numbers in 2021/2, expected to be in the range of 40 to 60.

The Petroleum Geoscience MSc targets recruitment from developing countries under UN sustainability Goal 7: Access to Affordable and Reliable Energy, where it is acknowledged that a switch to gas, displacing coal and other damaging fuels, has a net emission, environmental and health benefit. The course also delivers geoscientists to meet the UK net Zero goals and the UK Oil and Gas Authority (OGA) just released Net Zero plans, which details both a requirement for gas throughout the next two decades, plus ambitious plans for carbon sequestration, which will be delivered by the leading Energy companies and consultancies that are typical employers of our graduates.