

Geospatial Sciences at UCL



We must occasionally look like Monty Python's Judean People's Front, carefully honing their differences with the Peoples' Front for Judea. We are Geomatic Engineers, interested in Geospatial Sciences. How many MSc degrees do we need to cover our subject? The answer at UCL, until this year, was quite a few: Surveying, Hydrographic Surveying, GIS, Geomatics for BIM (and going back further, Geodesy, Photogrammetry, Remote Sensing, and others in the distant past). The differences mean a lot to us, but the university authorities occasionally raised a weary collective eyebrow and wondered how necessary it all was.

At the same time, of course, the content of the programmes was continually changing, sometimes overlapping each other, sometimes not. Our surveying students were using systems that were once the exclusive preserve of those on the MSc in GIS; our hydrographic students were launching drones from the decks of survey vessels; the man in the street has access to satellite imagery once reserved for specialist remote sensors. If you're scanning, are you a specialist surveyor or a BIM expert, and does it matter? In that climate, just how important is it to maintain the fine distinctions between programmes?

What is Needed?

So, a couple of years ago we sat down and asked ourselves some fundamental questions about what we were doing and what we wanted to offer our potential students. What do we do that is different will justify the time and resources that the students invest in our programmes and make them stand out in the job market? What will make them move into the next earning bracket, both in the immediate future and as their career develops? Are there things we shouldn't be doing? Are we wasting students' time teaching some of the fundamentals they should know before coming on our programmes? After all, the average geography undergraduate ends up as a competent user of GIS packages – our students must display specialist skills way beyond this.

Relatively quickly we can come up with some overall statements about the nature of the programmes that we offer and the attributes of those who graduate from them. Our students need to be advanced geospatial professionals above all else, with the IT and programming skills to yoke together different software packages to achieve their goals and/or the mathematical, computational and practical skills to handle projects involving multi-sensory platforms and systems. But the question remains: how many programmes do you need to achieve this and how integrated can they be?

Alongside that, we had a further consideration. Geomatics has a huge amount to offer students of other disciplines, and we are often approached by students studying, say, robotics and asked about how they can learn more about GNSS or scanning systems, for example. Too often we have had the problem that there is material that would be useful, but they've missed out on an essential introduction in the previous term. To be outward facing, we needed a self-contained module, or group of modules, to which we could point the non-specialists.

What Topics will be Covered?

The solution adopted was a new MSc in Geospatial Sciences that would replace all our existing programmes, but which would have specialist routes that students could elect to follow and would appear in the name of their degree. Thus, they can study Geospatial Sciences, Geospatial Sciences (GIS-Computing), Geospatial Sciences (BIM), or Geospatial Sciences (Hydrographic Surveying).

The core of the course consists of two modules on Geospatial Science and Geospatial Programming, compulsory for all students. The former covers the fundamental principles such as coordinate systems, mapping organisations, and cartography, and introduces the major systems for data acquisition. The latter covers programming in the context of geospatial science and technology, with students applying their skills to the automation of geospatial analysis workflows and map production.

Around this core, the different pathways are built. GIS-Computing has a strong focus on the analytical and technical aspects of the discipline, covering topics ranging from spatial analysis and databases to data mining and app development. The BIM route educates students in the geometric and semantic aspects of the subject, and the integrated management of geospatial and BIM-related data. The specialist Hydrographic Surveying route is run in collaboration with the Port of London Authority and has been recognised as a Category A course by the International Hydrographic Organisation. It focuses on data acquisition in the marine environment and includes a very substantial practical project element.

For non-specialists, we offer a module on Sensors and Location, focusing on the lower-accuracy mass-market side of these subjects and on how different sensors and systems are integrated. For engineering students interested in what geomatics can offer in terms of high precision measurement and monitoring, we offer an integrated package of modules on Data Analysis, Engineering Surveying, and Precision 3D Reality Capture. All these modules are part of the range that we offer our Geospatial Science students and are helping to ensure a high visibility for the subject across other disciplines within the university.

By re-organising all our programmes in this way, we have ended up with one main MSc programme (accommodating different routes and

themes), cut down on repetition and are delivering the optimum number of modules, and we have made our subject visible and accessible to associated disciplines. The new programmes are running this year, and we're accepting applications for 2019.

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<https://www.gim-international.com/content/article/geospatial-sciences-at-ucl-2>
