

## **THE DEPARTMENT IN CONTEXT**

UCL Civil, Environmental & Geomatic Engineering ('CEGE' for short) is a multidisciplinary department with a long tradition of excellence in teaching and research. We hold a substantial research portfolio, with research projects and centres reflecting a broad multidisciplinary view of the engineering world linking closely with industry leaders.

Our innovative undergraduate degree programmes have won praise from the Royal Academy of Engineering, and have strong links to industry; our research is embedded at every stage of the programmes. Our graduate degree programmes also closely follow our research interests.

### **About Civil, Environmental and Geomatic Engineering**

Engineering underpins almost every aspect of modern life. Civil engineers make vital contributions to designing, constructing and maintaining buildings, technology and infrastructure, and are at the forefront of sustainable development. Engineers create solutions which protect and restore our environment and are vital in responding to the challenges of climate change. Engineers measure and map our local communities, natural resources and structures, from microscopic to interplanetary scales.

Our degree programmes reflect this wide remit and encompass the full spectrum of civil engineering, from structures to geomatics and from earthquakes to transport, while continuing to provide a sound understanding of the underlying engineering principles.

Our research is at the forefront of engineering development. Our staff are leaders in their fields and are often called upon to provide detailed knowledge and advice to the media, industry and policy makers. We work with other academics, with industry partners and with local and national government to provide research and expertise.

### **Highlights from 190 years of Civil, Environmental and Geomatic Engineering at UCL**

Civil Engineering has been taught at UCL since its earliest days. The first Prospectus, published in 1826, offered a "*system of academical education*" to the "*young men intended for the scientific profession of Civil Engineer*". To fulfil this promise, the College Council appointed John Millington, Professor of Mechanics at the Royal Institution, to the Chair of Civil Engineering. However, financial considerations forced his resignation within a year.

In 1841 the Chair was accepted by Charles Blacker Vignoles, whose name is associated with the introduction of the flat-bottomed rail track. His work took him to both America and Russia, and his suspension bridge over the Dnieper in Kiev was the largest in the world at the time of construction. He was made a Fellow of the Royal Society (FRS) in 1855 and elected President of the Institution of Civil Engineers in 1870.

Victorian engineers became the heroes of the 19<sup>th</sup> century, and it was in this atmosphere that William Pole was appointed to the Chair in 1859. He was involved with the survey of the great Indian railway, consulted by de Lesseps on the proposed Suez Canal, and was an expert on harbours and waterways. His "*Theory of Whist*", based on the theory of probability, ran into 20 editions.

The real beginning of academic engineering came with the appointment of Alexander Blackie William Kennedy as Professor of Engineering in 1874 at the age of 27. He established laboratory

courses and coined the term 'engineering laboratory'. Lab experiments became an essential part of the students' work, and continue to do so today. In 1887 he was made FRS, was knighted in 1905, and elected President of the Institution of Civil Engineers in 1906.

Several years after Kennedy's arrival, Leveson Francis Vernon-Harcourt was appointed Professor of Civil Engineering. The son of an admiral and grandson of the Archbishop of York, he was an acknowledged authority on harbours, docks, rivers and canals, water supply, and sewage disposal, on all of which subjects he published books. The Institution of Civil Engineers organises an annual Vernon Harcourt Lecture to acknowledge his contribution, and the department awards the L.F.Vernon-Harcourt Prize annually to a student who demonstrates overall outstanding excellence.

Edwin Chadwick (1800-1890), a nineteenth-century sanitary reformer and public health pioneer, had a profound influence on the teaching of civil and environmental engineering at UCL. After his death, his determination to reform society through sanitary science was continued in perpetuity by a charitable trust established by a provision in his will. In 1898 Sir Osbert Chadwick (son of Edwin) was appointed the first Chadwick Professor of Municipal Engineering at UCL. To this day, the Department of Civil, Environmental and Geomatic Engineering is housed in the Chadwick Building, and Nick Tyler CBE, a former Head of Department, holds the Chadwick Chair in Civil Engineering.

In 1936 the Chadwick Chair was filled by H.J. Collins. Collins was a broadly based engineer who presided over the reorganisation of the Engineering Faculty at UCL and was elected President of the Institution of Structural Engineers in 1946. Collins was succeeded in 1961 by A.H. Chilver, one of the most influential figures in engineering education and training in the second half of the 20<sup>th</sup> century. During his tenure as head of department at UCL he reinforced the teaching and research in structural engineering, particularly nonlinear buckling, with the appointment of J.M.T.Thompson FRS, A.G.Walker and J.G.A.Croll. He ensured the continuation of the subject of Traffic Engineering at UCL by the establishment of a strong Transport Studies group under the leadership of Professor Reuben Smeed. After leaving UCL, Sir Henry Chilver became Vice Chancellor at Cranfield, set out a wide-ranging framework for professional engineering qualifications, chaired the Universities Funding Council and many government advisory committees, and was made a life peer (Baron Chilver) in 1987.

In 1945 the Departments of Civil Engineering and Municipal Engineering merged. The first surveying degree programme ran in 1949, and a separate Department of Photogrammetry and Surveying was established in 1961. The historic Jordanian city of Petra has been described by UNESCO as "one of the most precious cultural properties of man's cultural heritage". In 1965, academics from the Department of Photogrammetry and Surveying used photogrammetric technology to map the topography of the area and the facades of the sites.

The London Centre for Marine Technology was established in 1976 as part of a Research Council (SERC) initiative to promote interdisciplinary research in offshore engineering. Over the next 12 years, staff in the Civil & Municipal Engineering Department with specialisms in structures, soils, fluids and materials worked with colleagues in UCL Mechanical Engineering, Imperial College and City University carrying out large scale experiments and computer simulations in support of the North Sea offshore oil and gas industry.

In 1981 the Transport Studies group joined colleagues at Imperial College to establish the intercollegiate MSc in Transport Studies. This was the only MSc programme offered by the department at the time and continues to attract many well-qualified students from around the world to this day.

In 1991 the Department of Civil & Municipal Engineering was renamed the Department of Civil & Environmental Engineering, reflecting the increased importance of environmental issues in society. In 1997 the Department of Photogrammetry and Surveying became the Department of Geomatic Engineering.

During this period the then Head Department, Professor J.G.A.Croll, oversaw major changes to the fabric of the Chadwick Building. Mezzanine floors were added to the ground and first floors to create more office space for academic and research staff, including the Transport Studies group which up to that time had been located a short distance away in Flaxman Terrace. Also, the basement was excavated to create a lecture theatre and new workshop facilities and all the laboratories were refurbished.

### **Recent years**

In 2003, the Pedestrian Accessibility Movement Environment Laboratory (PAMELA) was opened under the supervision of the then Head of Department, Professor N Tyler. This novel and highly flexible facility allows full-scale pedestrian infrastructure to be built, tested and evaluated. An early use was for the Thameslink 2000 project; Nick Tyler and his team built a life-size train carriage to assess the boarding and alighting performance of the proposed trains.

In 2007 the Departments of Civil and Environmental Engineering and Geomatic Engineering merged to form the Department of Civil, Environmental and Geomatic Engineering (CEGE). In the previous year the two departments had jointly introduced innovative BEng and MEng degrees, including the option of a year abroad. These programmes were based around a series of eight one-week, multi-disciplinary, real-life projects (scenarios) separated by blocks of conventional teaching. This problem-led approach to learning from the start of their degree programmes prepared students for the major integrated design project in the 4<sup>th</sup> year. The emphasis on group work and the challenge of open-ended problems differentiated UCL graduates from those of other universities. CEGE topped the Guardian League Table for UK Civil Engineering departments in 2010 and 2011.

In parallel with the development of its undergraduate degrees, the department introduced a range of MSc programmes reflecting the breadth of its research interests in the fields of civil, environmental, geomatic and transport engineering. Each year the department enrolls between 200 and 250 MSc students and 90 new undergraduates.

The research now carried out within the department reflects a broad multidisciplinary view of the engineering world – from navigation of space shuttles and control of observation satellites to tunnelling beneath the planet's surface, from the development of new construction materials to sustainability and resilience, and from earthquake engineering and simulation of tsunamis to design of offshore structures and renewable energy systems - with constant reference to human needs. Our research projects and centres span disciplines and cross subject boundaries to provide innovative solutions and thinking for the benefit of all. We're engineering a better world.

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