Northumbria University – Newcastle upon Tyne, UK

Northumbria is the largest university in the North East, with 33,000 students from over 125 countries. Based in the popular, safe and vibrant city of Newcastle upon Tyne, Northumbria offers you one of the best academic and social experiences possible.

The University delivers many programmes around the following subject areas, Education, Health, Science, Engineering, Business, Law, Social Sciences, History, Design and IT.

The Department of Applied Sciences has an exciting and extensive portfolio of subjects including biology, biomedical sciences, chemistry, forensic science, food and nutritional sciences. Many of our courses are professionally accredited by the Royal Society of Chemistry, Institute of Biomedical Science and Association for Nutrition or approved by statutory regulatory bodies such as the Health & Care Professions Council.

Why Study a science-based programme with Northumbria?

- Programmes are accredited by Professional Bodies, examples include: Institute of Biomedical Sciences and Nutrition Society.
- International Student Barometer 2013/14 – 94% of international students in Sciences were happy with the course content and topic selection
- In the recent Research Excellence Framework results (Dec 2014), our research in Allied Health was ranked 27 out of 94 Institutions for its impact – with 60% of the research being world leading

Our Undergraduate Programmes include:

Applied Biology

Applied Chemistry

Human Biosciences

further details on the these programmes are available on the web **northumbria.ac.uk**

Analytical Science: A one year top–up programme from Diploma which includes both a substantial research project and scientific literature review. Subject specific core modules include; instrumental methods in drug analysis, analytical microbiology, as well as broader concepts and skills development in industrial quality assurance systems and advanced statistical methods. Option modules are also chosen with either a biological (DNA analysis) or chemical theme.

Biomedical Science: can equip you with the skills necessary to have an impact on health, diagnosis and treatment of disease. Visiting National Health Service (NHS) practitioners will enhance your learning experience and you have access to state-of-the-art laboratory equipment that is in line with NHS standards, including clinical chemical analysers and tissue culture facilities.

Biotechnology: is a rapidly growing applied science field and at Northumbria you will learn many transferrable skills as well as develop practical knowledge and skills. Study will include themes of molecular biology, immunology and bioinformatics, where emphasis will be placed on its applications within a range of industries, including; medicine and production of renewable fuel, food production.

Food Science & Nutrition: This programme examines all elements of food from production to absorption and is based in modern, specialist laboratories containing high-specification equipment. Stimulating projects in areas include food processing, quality and safety, technology and the identification of relationships between dietary intake and health.

Forensic Science: Our course is taught by former experienced forensic practitioners and you will have significant hands-on laboratory experience in, for example, analytical chemistry, blood pattern interpretation, DNA analysis and fibre examination, practical transferable skills of biology and chemistry and how these are applied in forensic casework.

Human Nutrition: will help explain the science and social factors at work in our diet. From this you will develop the skills and ability to help people choose nutritional diets while contributing to the growing public health agenda surrounding obesity. Upon graduation you will also be able to apply for Associate Level entry into the UK Voluntary Register of Nutritionists (UKVRN) which will increase your employability within this field.

Pharmaceutical Chemistry: if you have a passion for the uses of chemistry in modern society in the development, production and analysis of bio- active compounds. Accredited by the Royal Society of Chemistry (RSC) this course concentrates on aspects related to human biology including biochemistry, pharmacognosy, medicine, design and synthesis of drugs including computer-aided molecular modelling.

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Our Postgraduate Programmes include:

Biotechnology (delivered as either a 12 or 21 month programme) the main focus of the course is on molecular biotechnology. Molecular biology, (molecular) genetics and bioinformatics form the 'backbone' of biotechnology, and different aspects of these feature in a number of modules. You will study gene expression and protein production and purification, and applications thereof in different biotechnological fields.

Food Science (12 month programme) The curriculum covers modern aspects of food processing, food analysis, food safety and quality, sensory perception, food policy, statistics and general research skills. MSc research projects are given in industry relevant topics and you will be guided by experienced academic members who are in close collaboration with the top food manufacturing industry, via current research programmes and consultancies.

Forensic Science (12 month programme) The programme is aimed at those from traditional science subjects (ie the Chemical or Biological Sciences) and builds on the scientific knowledge gained at undergraduate level and focus, apply and extend this knowledge and its associated skills into specialist areas in Forensic Sciences which are then developed in their applications to Forensic Science as well as the management of Forensic Science within the investigation process and the Criminal Justice System.

Microbiology (12 month programme) This is an important and wide-ranging discipline within the life sciences, covering a range of subjects that are relevant to human health and disease, environmental studies and industrial/biotechnological applications. The course builds upon the University's research strengths in microbiology, including: diagnostic microbiology, molecular microbiology, microbial systematics, environmental microbiology and microbial enzymology.

Nutritional Science (12 month programme) Nutrition is of great importance for a number of aspects e.g. reducing the impact of a broad number of diet related diseases, obesity, type 2 diabetes, or cardiovascular diseases, securing a healthy ageing population and avoiding malnutrition. The curriculum covers advanced human nutrition, nutrient analysis, sensory perception food policy, bioethics, aspect of food processing, statistics and general research skills.

Public Engagement with Science (12 month programme) Delivered jointly by Northumbria University and the Centre for Life, this high profile partnership provides a balanced technical and theoretical programme aimed at maximising outreach and public engagement work in science.

Short Courses or Specialist Curriculums

Summer School – 2 week specialist Biotechnology programme

Are you currently studying for a Undergraduate degree but want to experience the UK culture and education experience for a short period of time? We offer a two week Biotechnology summer school incorporating both practical and theoretical components and cultural activities.

Interested in other short course opportunities then please make contact and ask about other opportunities.

Research and Consultancy

The Department of Applied Sciences contributes primarily to the University's research themes in Cellular & Molecular Sciences and Health & Lifestyle studies. We have research groups focused on the following subject areas:

Applied Chemistry Group – members take chemical synthesis, analytical chemistry and modelling approaches to a range of projects including Fine Art conservation and artist materials; luminescent metal complexes in materials science; medicinal chemistry and substrates for microorganism detection and identification; volatile organic compound analysis.

Health Interventions and Wellbeing Research Group – highlights include our work examining the effects of dietary components on in vivo measurements of blood vessel function (e.g. as a risk factor for cardiovascular disease) and metabolomics work assessing the effects of nutritional interventions. Our Nutrition at Work project delivers targeted, nutrition-related information in the form of workshops for employees at their workplace.

Mammalian Cell Biology & Immunology Group – highlights include our work on Biomarker analysis; cancer and therapy-related leukemia; molecular mechanisms of arthritis, ageing and neurological diseases; serpins in cardiovascular disease; T-cell immunology and vaccine design

Microbiology Group – highlights include our work on microbial enzymes as biocatalysts (through our Nzomics Innovation Unit); molecular ecology and microbial community analysis in human health and in the environment; genomics (see NU-OMICS); and the molecular basis of microbial virulence, particularly understanding the bacterial cell envelope.

Northumbria Centre for Forensic Sciences is a multi-disciplinary research centre that brings together a wide range of research themes – including forensic genetics, trace evidence, forensic anthropology, sociology, bioethics, and science and technology studies

Facilities

Our laboratory facilities reflect the full breadth of the department's teaching and research activities. We teach in large modern, well- equipped laboratories with audio-visual facilities to enhance our ability to demonstrate techniques or interesting observations.

Some facilities are organised into specialist areas:

Genomic, proteomic and metabolomics profiling Illumina – MiSeq Next generation sequencing, Q Exactive Hybrid Quadrupole-Orbitrap mass spectrometer, 2D protein electrophoresis Dionex UltiMate 3000 nanoflow liquid chromatography/Bruker HCT Ultra

Forensic genetics – single cell and low template DNA amplification lab, capillary electrophoresis-based Sanger sequencing, MiSeq Next generation sequencing.

Microbiology and molecular biology – fully equipped for molecular biology manipulations and imaging, RT-PCR, pilot scale bioreactors

Automated clinical analysis – Randox Daytona Clinical Chemistry Analyser, Sysmex Haematology analyser

Anatomy, histology and microscopy – dissection area, Cryostat microtome, automated histopathological processing & staining, light and fluorescence microscopy suite.

Cell Biology and Immunology – two multi-user tissue culture laboratories, Eli-spot assays, Syngene GBox Chemi XX6 ECL imaging, 8-colour flow cytometry, and fluorescence microscopy, Acea Xcelligence for cell function assays, MSD Biomarker analytical equipment

Neurophysiology Biodex Dynamometer, upper arm assessment rig, Transcranial Magnetic Stimulator, electromyography.

Food processing and sensory analysis – food processing pilot plant, Food product development laboratory, Organoleptic analysis laboratory, Knauer simulating moving bed chromatography rig, GC-TOF for aroma analysis

Chromatography - Extensive High Performance Liquid Chromatography and Gas Chromatography / GC Mass-spectrometry capability.

Contact

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