



University of
Strathclyde
Science

WORKING WITH BUSINESS
AND INDUSTRY

The Faculty of Science – Working with Business and Industry

The University of Strathclyde's Faculty of Science has a strong track record of helping business and industry to develop better products and services. We understand your need to improve productivity and profitability and we can provide a range of services to help with this including consultancy, applied research, continuing professional development courses and equipment rental. This leaflet will give an overview of these services and will provide information on how your organisation can successfully partner with our extensive expertise across the Faculty of Science.

The Faculty of Science has five Departments:

- Computer and Information Sciences
- Mathematics and Statistics
- Physics
- Pure and Applied Chemistry
- Strathclyde Institute of Pharmacy and Biomedical Sciences

Whether you're an SME in an emerging relationship with the University, a company wishing to grow an existing partnership or a large multinational, we look forward to working with you.

Consultancy

We share our expertise with partners in industry through consultancy. Details of our many areas of expertise can be found on our Departmental webpages, or you can speak with the Knowledge Exchange Director in the relevant Department for more information (contact details can be found on the back page). Below are some examples of current consultancy projects:

1. Physics have a variety of such projects resulting from their long standing relationships with laser manufacturing companies like M Squared Lasers and Coherent Inc., providing development expertise and testing facilities. They are also a leading developer in quantum technology, working for a broad range of companies in the UK defence and security sector.
2. Through close collaboration with Horiba IBH the Department of Physics is a main contributor to the development of time-resolved fluorescence spectroscopy.
3. Mathematics and Statistics conducted statistical analysis of data related to financial irregularities for a national regulatory body (name under confidentiality). Algorithms were developed to automatically forecast the magnitude of such irregularities as new data became available.
4. Mathematics and Statistics used mathematical models of wave propagation to produce algorithms to accurately interpret the results of complex acoustic tests for a global engineering company (name under confidentiality). Acoustics tests are an example of non-destructive testing methods to identify defects in components.
5. A Computer and Information Science colleague acted as an expert witness in mobile interface patent cases. This included preparation of reports on patent validity and product infringement, review of considerable materials, formal deposition, delivery of evidence in court and cross-examination. This included work in

Australia in the Samsung-Apple cases relating to iPhone patents, and in the USA giving evidence on mobile text entry and zooming mobile interfaces with The University of Strathclyde working for Google and Asus.

Chemistry Clinic

Our Chemistry Clinic facilitates access for SME and larger companies to instrumentation or consultancy services, for projects of all scales. This service can provide direct support to any project with scientific guidance or assess current processes and materials for further development. Recent projects where we have successfully assisted external partners include:

- developing quality control methodologies for an organic products based company
 - understanding a newly developed product's capability in the current market for use in a log cabin manufacturing company
 - evaluation of new materials, small-scale compounding and thermal analysis for a leading global producer of polyester film
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Industry Funded Research

Research is of central importance in everything we do as a Faculty. It informs our teaching and helps us to make a difference to business, industry and society as a whole. All our Departments work closely with industry partners to help develop innovative new products and services. We have several specialist industry-facing centres; these include:

- Centre for Process Analytics and Control Technology is a consortium of seven universities and 15 companies undertaking research, training

and knowledge exchange to support manufacturing excellence

- The Institute of Photonics is a commercially oriented research unit with the key objective to bridge the gap between academic research and industrial application and development in the area of photonics, through excellence in commercially relevant research and its use
 - CMAC (Continuous Manufacturing and Advanced Crystallisation) is working in partnership with industry members to transform medicines manufacture. The CMAC National Facility offers contract research support through the delivery of services within crystallisation process development & understanding.
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CPD

We regularly work with our partners to upskill their workforce, offering training on a wide range of topics, such as those below. We are happy to create bespoke training courses so please contact us to discuss your requirements. Examples of CPD we offer include:

Computer and Information Science:

The Department run three bespoke apprenticeship degree programmes which provide employers with a fully-funded pathway for current employees and new recruits to achieve undergraduate and postgraduate degrees while continuing to work in employment. The BSc (Hons) IT: Software Development and BSc (Hons) Digital and Technology Solutions are 4-year programmes which develop apprentices' software development/IT knowledge, skills, competencies and professional behaviours. The MSc Cyber Security degree is an 18-month programme which develops apprentices' knowledge, skills and

professional competencies in protecting and defending information systems from attack. Students currently studying on these programmes are employed by a range of companies and organisations such as J.P. Morgan, Morgan Stanley, Barclays, Thales, Leidos, various SMEs and the HE sector.

Mathematics and Statistics: For a local manufacturing company the Department provided CPD on standard statistical methods associated with quality assurance. The training upskilled quality assurance personnel to enable better use and interpretation of quality data.

Physics: Working closely with the laser manufacturing community in the Greater Glasgow Area and across Scotland, the Department provide bespoke laser handling and safety training.

Strathclyde Institute of Pharmacy and Biomedical Sciences: The Institute run a 2-week course 'Introduction to methods used in vaccine development' which is high in practical content.

Pure and Applied Chemistry: The Strathclyde and GlaxoSmithKline Collaborative MPhil and PhD Research Programme was launched in 2009. This extensive research and knowledge transfer venture is the first of its kind within the UK pharmaceutical industry. In summary, one arm of this overarching programme provides an innovative framework facilitating GSK employees to study towards higher research degrees (MPhil and PhD) through their industry-based projects in collaboration with the University of Strathclyde. Through this approach, the registered industrial students remain within the company premises as progress is made towards research degree completion, under

joint supervision with Strathclyde and GSK colleagues. Current areas of research focus for the Doctorate@Work scheme include: Synthetic and Medicinal Chemistry, Process Chemistry, Analytical Chemistry, Computational Chemistry and Informatics, Biostructural and Biophysical Chemistry, Biological Sciences, and DMPK.

Facilities Hire and Materials Testing

Within the Faculty's five Departments we have state-of-the-art equipment and facilities which could provide unique insights for your company and can be hired for projects or specific pieces of work. We can also offer materials testing in our facilities, undertaken by University staff. Examples include:

1. The liposome formulation team in the Strathclyde Institute of Pharmacy and Biomedical Sciences, have the most advanced equipment available to help with the design, formulation and manufacture of lipid-based nanoparticles. They can help with targeting drugs and vaccines, solubility issues, pharmacokinetics, in vitro studies and assessment in-vivo.
2. The Department of Physics provides cleanroom facilities equipped with coating apparatus as well as cutting and manipulating equipment. Their electron microscopy facilities offer state-of-the-art materials inspection and evaluation services for industrial partners.
3. The Department of Physics' Scottish Centre for the Application of Plasma-based Accelerators provides unique development and testing opportunities for a wide variety of industrial, medical and scientific applications.
4. Materials characterisation capability in Pure and Applied Chemistry includes thermal and X-ray analyses,

high temperature FTIR spectroscopy, environmental testing and unique capability in evolved gas analysis. If this is of interest, please contact the relevant Department to discuss further.

Knowledge Transfer Partnerships

A KTP is a three-way project between one of our academic staff, your organisation and a recently qualified graduate (KTP Associate) who works in your organisation. It is a leading programme for helping businesses to improve their competitiveness and productivity through the better use of knowledge, technology and skills.

At Strathclyde, we've a major commitment to KTPs, and host the West of Scotland KTP Centre, the largest of its kind in Scotland and one of the premier centres in the UK. In the past 18 years, the centre has helped establish over 300 projects and has generated more than £40 million of KTP grants in the west of Scotland. 94% of companies who partake in a KTP project achieve or over achieve their objectives. On average outcomes for companies are:

- £60k increase in pre-tax profit during the KTP
- £600k p.a. increase in pre-tax profit for the 3 years following KTP completion
- 20 company staff trained / 2 new jobs created

Recent KTPs in the Faculty of Science include:

1. Company Partner: AB Agri Limited, Partnership Objective: To abolish antibiotic consumption in animal feeds by developing novel nano-delivery systems incorporating bioactive lipids and peptides: supporting effective antimicrobial stewardship to reduce antibiotic resistance in the food chain

without compromising animal welfare.

2. Company Partner: Buddi Limited, Partnership Objective: To develop durable, sensitive, low cost wearable sensors for remote monitoring of individuals at risk.
3. Company Partner: TMD Technologies Limited, Partnership Objective: To develop and commercialise a miniaturised, self-contained, integrated platform for atom cooling within a hand held package for use in next generation quantum technologies.
4. Company Partner: BiP Solutions Limited, Partnership Objective: To embed key technical expertise, principally in the field of data science, in order to enable the development of the next generation of unique business intelligence products and services.
5. Company Partner: Cambridge Quantum Computing Limited, Partnership Objective: To embed knowledge of advanced type systems, to create a new programming language with a state-of-the-art type system for quantum software, improving productivity and in-house capability.
6. Company Partner: Vascutek Limited, Partnership Objective: To embed expertise and understanding of the properties and chemistry of gelatin, a critical raw material and component of our medical devices, to allow design and implementation of efficient, optimised product manufacturing processes, enabling future exploitation of new clinical opportunities.

Join us at our events to find out more

Throughout the year we run a number of events open to partners, alumni and industry. These include a regular series of Business Breakfasts where attendees enjoy breakfast while hearing from University academic staff and invited speakers from industry followed by networking. Please sign up to our Business and Industry Engagement Mailing List to ensure you informed of forthcoming events: tiny.cc/jcaiiz

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Information current at September 2019. Please consult the University website for the most up-to-date information. The University of Strathclyde is a charitable body, registered in Scotland, with registration number SC015263.