

# TEACHING BY EXAMPLE

UNIVERSITY OF WESTMINSTER

The University of Westminster uses SAS® in a range of innovative MSc and undergraduate courses.

## Business Issue

Exposing MSc and undergraduate students to the most effective tools and approaches available in analytics, business intelligence and data quality.

## Solution

Advice and practical help from the SAS® Academic Programme and Customer Support including input into course content, free software trials and making SAS available for students' personal use. SAS technology includes SAS® Enterprise Miner™, SAS® Data Integration Server, the SAS® Data Quality solution and DataFlux® solutions.

## Benefits

SAS supports the design, development and delivery of innovative courses, including a world-leading new MSc in Information Quality, helping address skills shortages and ensure graduates are more employable.

The coming together of the University of Westminster's mathematics and information sciences departments provided a unique opportunity to develop new inter-disciplinary courses in analytics, business intelligence and data quality. With SAS already featuring in undergraduate modules and providing core elements of an MSc in Decision Sciences, an Enterprise Information Systems MSc was developed and, with SAS' continuing help, the University has now created an innovative MSc in Information Quality.

"I started using SAS in undergraduate modules in 1998," says Michael W. Rees, Director of Knowledge Transfer in the School of Informatics. "I was interested in giving students experience of using software they'd find in a commercial environment." Reflecting the widespread use of SAS, its proven capabilities in enterprise intelligence, and thanks to consistent support from the SAS® Academic Programme and Customer Support, SAS has since become a key aspect of studies. "We want our graduates to be as employable as possible, and exposing them to SAS helps," says Rees. "We need to ensure they have the best skills so they have more opportunities. We also have a responsibility to provide a balanced curriculum, which means looking at other tools in addition to SAS. But our use of SAS is clearly important. In 2002 we decided to co-operate with SAS on designing course modules, and benefited from very interesting feedback. We now make explicit reference to SAS and use SAS products in various undergraduate modules and MSc courses." Technologies used include

SAS® Enterprise Miner™, SAS® Data Integration Server and the SAS® Data Quality solution.

## Decision sciences – analytics for management

"The Decision Sciences MSc dates back to 1991, and SAS was involved from the start," says Charles Poulter, Senior Lecturer, Department of Information Systems. "For the last seven years, it's been a central part of the course." He says SAS has been "wonderfully supportive. For example, providing free trials of new software and training courses. We've always received an immediate and helpful response from contacts in the SAS Academic Programme." SAS support has included enabling students to have their own copies of the software. "In particular, students are keen to explore data mining and are very interested in SAS Enterprise Miner," adds Poulter. "In fact, in the Decision Sciences MSc and data mining module, students use SAS for the projects almost without exception, in organisations where they work. SAS is simply the default analysis software."

## Taking an enterprise view

Dr Tereska Karran, Senior Lecturer in the Department of Information Systems, leads the MSc programmes in business intelligence and information quality. "We offer a very flexible approach," she says. "As business intelligence had diversified, we have diversified our MSc programme." This included developing the Enterprise Information Systems MSc, which covers areas such as architecture, data quality, information flows and security,

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University of Westminster

extending into management and broadening the scope to place technology in a business context. Dr Karran says, “When we started, we looked at the options available to demonstrate the skills necessary for building enterprise applications. Based on our history, we decided to stay with SAS tools. We actually use SAS Data Integration Studio to show students how to construct an enterprise information architecture, which has been extremely helpful.”

Students typically have a first degree in Computer Sciences. “They tend to be employed but want to do more; they may already be working in the area and understand the importance of business intelligence,” says Dr Karran. “The data mining students are different and usually have a mathematics background. So there are two streams students can follow – a business stream, and a mathematical one. Students may start in one and transfer to another.” The University has also introduced business intelligence as part of its undergraduate programme. Students can progress from BSc to MSc, with the flexibility to take modules from across the courses available, or can follow a specialist pathway from the outset.

### **Research and projects – using SAS® to solve real-world problems**

“We’ve had some very interesting projects in Decision Sciences, with many applications using SAS,” says Poulter. “In the civil service, these have included analyses around Income Tax for small businesses. In the Prison Service, which has large data volumes and uses SAS as its standard environment, analysis explored the effects

on dependents when prisoners are moved to different prisons. Another project covered NHS Trusts, analysing data on specialist examinations. There have also been various projects in the direct marketing area, looking at changes in a company’s customer base to predict which customers would buy which products.”

Dr Karran says projects in Enterprise Information Systems are very different, and typically longer. “Many cover areas like virtualisation, personalisation and creating autonomous systems,” she says. “Several have involved local authorities that want to address government initiatives. There can be many performance measurement systems involved, and projects have looked at predicting problems an organisation might run into. We also have many projects in retail. These might cover how an enterprise architecture can be modified, to better manage the architecture and deal with problems in information flows. On the personalisation side, projects can cover areas like analysing web logs for user profiling, to provide personalised interfaces to a website.”

### **Driving information quality – a new SAS® based MSc degree course**

“The biggest problem facing enterprises today is the quality of their data,” continues Dr Karran. “This has become a big issue, and is recognised by large organisations – problems with extracting, transforming, cleaning and loading data. Companies are facing massive internal compliance issues, and face being investigated and fined. It’s not that organisations don’t know their data is dirty – they do – but they don’t have the

expertise to deal with it.” Indeed, SAS had alerted the University of a major shortfall in experts. To address this, Westminster developed its MSc in Information Quality, which launched in 2007. The course is designed to enable database administrators, data analysts and managers to expand their knowledge and skills.

“SAS provided a range of tools to show the practicalities of dealing with data quality issues, as part of our platform for the MSc,” says Michael Rees. “This is a developing area, with more developments needed, but it’s clear SAS tools are state-of-the-art. Using SAS will give students brilliant experience.” With DataFlux® solutions a key element of the MSc, course content includes Enterprise Applications, Security, Data Mining and Statistical Modelling. Specific modules include Business Dynamics and Strategic Modelling, Advanced Issues in Database Systems, Management Accounting and Financial Modelling, Corporate Systems and Data Management, and Interoperability. Rees adds, “This is only the second course of its type in the world, and there’s a real shortage of research and expertise, so we are collaborating with other Universities.” These include the University of Arkansas, through them the Massachusetts Institute of Technology (MIT), and the University of Southern Australia; both the Arkansas and Australian universities also use SAS.

In summary, Poulter says: “SAS clearly understands the market we are in – it’s involved in so many universities. One of the reasons why using SAS is so important is that it holds such a dominant position in the marketplace. We know we are training students in tools and methods that will help them find employment.”



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