

BUSINESS INFORMATICS AND INFORMATION SYSTEMS -SOME INDICATIONS OF DIFFERENCES IN STUDY PROGRAMMES-

Markus Helfert / Howard Duncan

Dublin City University

School of Computing

Dublin 9, Ireland

Phone: +353-1-700 8727

Fax: +353-1-700 5442

Email: {markus.helfert | howard}@computing.dcu.ie

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Abstract:

Traditionally, universities have offered various courses related to Information Systems. However, the dynamic and rapid changes in recent years, the move towards a more applied and professionally-orientated education, the Bologna agreement and the increasing pressure to ensure funding demand constant evaluation and modification of education programmes. Despite attempts that have been made to provide reference curricula, many universities struggle with the proper direction and design of the Information Systems curriculum. This article aims to present a framework for structuring Information Systems study programmes in Europe. In addition, our article illustrates some indication of differences between selected study programmes in Information Systems in the UK and the German-speaking countries. Our results show that even in the context of the Bologna agreement the study programmes nationally and internationally are still very diverse and difficult to compare. In addition the analysis reveals indications that the controversy in Information Systems is often due to two related but fundamentally diverse streams, with on the one hand a technology- and engineering-orientated focus and on the other a business- and management-orientated focus.

1 INTRODUCTION

Over the last decades, Universities have offered various courses in Management, Information Technology, Computer Science, Software Engineering and more recently Information Systems, Information Management and Business Informatics. Various courses have been established at many universities and in particular the growth of information technology and information systems related programmes is expected to continue. However, recently there are concerns that the number of students registered for information system related courses could stagnate or fall.¹

The dynamics and rapid changes in recent years and the demands towards a more applied and professionally orientated computing and information system education (Denning 2001) require constant evaluation and modification of education programmes. Indeed, claims that IT is no longer a source of strategic advantage, has generated a growing concern over the loss of technology-orientated jobs (Carr 2003). This will increase the emphasis on 'business-orientated' IT jobs (Benamati and Mahaney 2004). It can be expected that demand will increase for subjects as application design and integration, enterprise architecture, information management and business process management (Taylor 2003). The demand for graduates capable of coordinating complex information and supply chain networks and project managers managing global IT projects is also expected to increase (Löwer 2005). In addition, students may need to understand how to manage project teams, especially geographically and ethnically diverse teams. On the other hand, information technology and its implication for the IS field should also be considered as key element of information systems (e.g. Orlikowski and Iacono 2001; Benbasat and Zmud 2003). In this context, universities are expected to provide a broad business and real world perspective, strong analytical and critical thinking skills, interpersonal communication and team skills as well as core knowledge of information systems and a solid methodological foundation in design and implementation of information technology solutions that enhance organisational performance (Gorgone et al. 2002, Lehner 2001, Disterer, Fels and Hausotter 2003). As a consequence of the changing requirements, established study programmes and career paths of information system graduates might have to be modified or enhanced. This pressure rises as Universities are increasingly expected to offer attractive and profitable study programmes. Schools with traditional computing degree programmes are developing variations of IT programmes (Landry et al. 2003). Business Schools are offering various types of Management Information Systems courses.

Nevertheless, although attempts have been made to develop frameworks for Information Systems (like for instance Bacon and Fitzgerald 2001) and to provide reference curricula as for instance the *MSIS 2000 / IS2002 – Model curriculum and guidelines for graduate degree programs in Information Systems* (Gorgone et al. 2000, Gorgone et al. 2002), study programmes and research aspects related to Information Systems are diverse and often controversial discussed, emphasising different aspects of Information Systems (e.g. Orlikowski and Iacono 2001; Benbasat and Zmud 2003; Klein and Hirschheim 2003; Straub 2003; Galliers 2003; Robey

¹ for numbers of students studying information systems in the UK see for example <http://www.hesa.ac.uk/holisdocs/pubinfo/stud.htm>.

2003; DeSanctis 2003; Lyytinen and King 2004). Frequently discussions about the core and subjects of Information Systems degrees emerge, like for instance an extensive discussion in July 2004 on the ISWorld mailing list (www.isworld.org) with about 100 contributions related to programming in the Information System curriculum. In some discussions it seems that the Information Systems curriculum should include many (if not all) related subjects ranging from Business and Information System Strategy to Management and Marketing, Organisational Concepts, Modelling and Information System Architecture, Programming, Mathematics, Statistics and Operations Research as well as Computing, Networking and Communication Technologies. In addition, the complaint often heard on a regular basis from practitioners is that university educators do not prepare their students adequately enough for the demands of the real world. Thus, in addition to the multiplicity of disciplines, an Information Systems study programme should also provide a practical orientation that fulfils the particular requirements of enterprises. In summary, sometimes it seems that information systems graduates are expected to be the “all-in-one person solution suitable for every IS related problem”, or as Benbasat and Zmud (2003) generally conclude for the field of IS, a clear identity of the Information Systems discipline is (still) missing. Consequently many universities struggle with the proper direction and design of Information Systems related curriculum.

However, there are indications that the controversy is often due to two related but fundamentally diverse (but complementing) streams in Information Systems, with on the one hand a technology-, engineering-, and method-orientated focus and on the other a business- and management-orientated focus. Similarly, a different emphasis in Information Systems-related degrees is sometimes stated between the Anglo-American Information Systems community, with an emphasis on management aspects, and the Business Informatics community in German-speaking countries with an emphasis on Information Systems Engineering (e.g. Kurbel 2005).

The objective of this article is to evaluate and illustrate differences between some typical Business Informatics degrees in the German-speaking area and Information Systems / Information Management study programmes in the UK by comparing selected curricula. For this explorative analysis we adopt an analysis framework. A focus is given on selected study programmes in Business Informatics in the German-speaking countries in contrast to selected Information Systems study programmes in the UK. The study completed and presented in this article aims to provide the foundation for a more comprehensive analysis of European study programmes, which is intended as part of the ERASMUS-funded curriculum project BIN-Net aiming to develop a common degree in Business Informatics in Europe.

The article is structured as follows: First a brief overview about the development of Business Informatics and Information Systems degrees will be given. Then we describe the research design and the framework for the explorative comparison of study programmes. This builds the foundation for Section 2.3, which presents the qualitative and consolidated results of our study. The paper concludes with a summary and further research directions.

2 BUSINESS INFORMATICS AND INFORMATION SYSTEMS

First emerging in the 1970s as a technology oriented course in business, over the last three decades Business Informatics (in German: Wirtschaftsinformatik) is increasingly accepted as a field of research and study in Information Systems. Like Information Systems, Business Informatics focuses on business information systems as socio-technical systems comprising both machines and humans (Ferstl and Sinz 2001, Retzer, Fisher and Lamp 2003, Wissenschaftliche Kommission der Wirtschaftsinformatik 1994, Heinrich 2001). A growing number of universities in the German-speaking countries offer study programmes in Business Informatics with increasing numbers of graduates (Mertens and Barbian 2002).

In contrast to informatics, which primarily concerns the technology of information and communication systems, and business, which focuses on management functions, Business Informatics centres around business information systems with the objective of supporting business functions. Business Informatics concerns the concept, development, implementation, maintenance and utilisation of business information systems (Disterer, Fels and Hausotter 2003, Scheer 1998). In addition to managing the information systems, Business Informatics also focuses on the relationship between humans, business functions, information and communication systems and technology (Heinrich 2002). As a science discipline business informatics is generally categorised as (Wissenschaftliche Kommission der Wirtschaftsinformatik 1994)

- *applied science* that studies real world phenomena,
- *formal science* that creates and applies formal description methods and models,
- *engineering discipline* that systematically design and constructs information and communication systems.

Therefore Business Informatics is interdisciplinary (Gesellschaft für Informatik 2003) and can be summarised as a socio-technological and business oriented subject with *engineering* penetration (Disterer, Fels, Hausotter 2003).

In the German-speaking areas Business Informatics courses in general (still) lead to a *Diplom* after five years of study. Thus, the equivalent qualification in the UK is a Master degree. In the UK, information systems courses are offered at MSc level in a significant number of universities. These fall into two kinds – “conversion” courses and “add-on” courses. The conversion courses are offered to graduates in disciplines other than computing, and aim to provide a competence in computing disciplines and the business applications of information technology. In general they do not provide a deep study of either discipline, nor of information system engineering aspects. The add-on courses are typically offered to graduates in Computer Science, and offer an understanding of information management and the place of IT in business processes. Some of them offer advanced courses on business studies, information management and information strategy.

3 AN EXPLORATIVE COMPARISON

Research design and selected study programmes

The objective of this paper is to provide indications of differences in information system-related study programmes between the UK and the Germany-speaking countries. At present, our explorative study does not intend to provide a comprehensive evaluation of all related study programmes in these regions. This will be the subject of further research. However the objective of this paper is to provide an adequate research framework and present first indications of our analysis. Our analysis was carried out between September 2004 and December 2004 and is based on electronically available documents of study programmes. Where further course information was unavailable on the university's web page we exclude the study programmes from the detailed analysis.

The document evaluation was completed in four steps:

First we compiled a list of universities and study programmes to be considered by selecting Information System departments in the UK and the German-speaking countries. This was completed by a web search for Universities offering an Information System related degree, using in addition to a search with a search Engine (Google.com), lists of Information System departments in Europe and university rankings. For instance we used the following Information:

- Information Systems Departments in Europe (<http://juliet.stfx.ca/~rmackinn/infosys/europe.htm>)
- IS Departments in the UK (<http://www.cs.york.ac.uk/cgi-bin/ukais.cgi?f=isdepts>)
- Information Systems Graduate Schools in the United Kingdom and Ireland (http://www.gradschools.com/listings/UK/info_sys_uk.html)
- UK University Grading and Ranking Systems (http://www.britishhighereducation.com/British_Education/05Grading_and_Ranking_Systems.asp)
- List of 'Wirtschaftsinformatik' study programmes in Germany (<http://www.studienwahl.de/>)
- Ranking of Intuitions that published in the journal "Wirtschaftsinformatik" (Resch and Schlögl 2004).

However due to the large number of Universities, we had to limit our set of Universities to most relevant study programmes. In order to identify these Universities, we used the above-mentioned ranking information and expert opinions by Professors and Lecturers teaching Information Systems. The list of Universities considered for the detailed study is listed in the Appendix. Indeed, this is not a comprehensive list of Universities offering Information System-related courses, but for an indicative comparison the list seems appropriate.

In a second step descriptions of study programmes were collected and a comprehensive list of taught subjects compiled.

In the third step an evaluation framework was developed, which synthesises two important recommendations for study programmes in Information Systems and Business Informatics.

Finally, the taught subjects are assigned to the categories within the framework and *qualitatively* analysed.

The evaluation Framework

In order to develop a categorisation framework, in a first step we compiled a list of taught subjects in the selected study programmes (see Appendix). This initial list provided us with a good overview of the content and emphasises of study programmes. However, as the large number of different subjects indicate, a further classification was necessary in order to identify differences between the degrees. Therefore we synthesized the *MSIS 2000 / IS 2002* model curriculum framework (Gorgone et al. 2000; Gorgone et al. 2002) and the *recommendation for Business Informatics at Universities* (Gesellschaft für Informatik 2003), short: BI recommendation.

The MSIS 2000 / IS 2002 model curriculum is explicitly developed to include knowledge elements from three major computing disciplines: computer science, software engineering, and information systems. It provides a coherent structure for a study programme in Information Systems, and thus seems to be appropriate. However the curriculum is based on the educational system and degree structures common to the USA and Canada. This proved to be an advantage, as in the context of the Bologna agreement European Universities are restructuring their study programmes towards a 2-phase curriculum with Bachelor and Master degrees.

The recommendation for Business Informatics is issued by the German Association for Informatics and the Association of University Professors of Management, Germany. It is aimed at providing common directions for education in Business Informatics at Universities. In contrast to the MSIS curriculum, which provides a detailed recommendation for a curriculum, the BI recommendation is intended as guideline and is focused on key qualifications and core subjects to be taught. In addition, the BI recommendation is mainly orientated on a study programme of nine semesters leading to a degree of “Diplom-Wirtschaftsinformatik” (Diplom in Business Informatics) that is still very common in the German speaking regions.

In order to cluster subjects and to match the consolidated list of taught subjects, we customised the initial framework in an iterative process. The final framework is presented in Table 1. The structure follows basically the proposed curriculum building blocks in the MSIS curriculum. However, in order to accommodate the particular subjects taught in Germany and the UK, we added subject blocks of Mathematics and Logic, Structural Science, Legislation, and Economics, and Business Engineering², and included often taught business subjects like Logistics, Procurement, and Supply chain Management. The list of career electives and domain specific subjects presented here illustrates just some of the possible topics.

² For an outline of the content of Business Engineering see for example Winter (2002).

Fundamentals in Informatics	Business and Economics	Information Systems	Integration and Enterprise Engineering	Domain-specific career electives (representative)
<p><i>Information and Communication Technology</i> (Hardware, Software, Networks and Communication Technology)</p> <p><i>Programming and Algorithms, Data and Object Structures</i></p> <p><i>Mathematics and Logic</i> (Analysis, linear Algebra, Numeric, Logic)</p> <p><i>Structural Science</i> (Decision theory and methods for strategic decision making (e.g. risk analysis), statistics and quantitative models and methods, operations research, computational modelling and simulation)</p>	<p><i>Accounting and Financing</i></p> <p><i>Marketing, Production, Procurement, Logistics, Supply Chain Management</i></p> <p><i>Organization, human resources and corporate management</i></p> <p><i>Legislation and Economics</i></p>	<p><i>Fundamentals of Information Systems</i> (Types of IS, IS Industry, IS relevant legal frameworks, Management and IS)</p> <p><i>Principles of Business Information Systems</i> (Principles of functional and process orientation and industry solutions)</p> <p><i>Data Engineering</i> (Data modelling and management, knowledge engineering and business intelligence)</p> <p><i>System and Software Engineering</i> (analysis, modelling and design)</p> <p><i>Managing Data Communication and Networking</i></p> <p><i>Information Management</i> (Information, Knowledge and People, Project and Change Management, IS/IT Policy and Strategy, Ethics and Privacy)</p>	<p><i>Business Engineering and Information System Architecture</i></p> <p><i>Integrating Information System Functions, Processes and Data</i></p> <p><i>Integrating Information System Technologies and Systems</i></p>	<p>Academia and Research</p> <p>Biochemistry and Molecular Biology</p> <p>Consulting</p> <p>Consumer Health Information</p> <p>Customer Relationship Management</p> <p>Data Warehousing</p> <p>Decision Making</p> <p>E-Government</p> <p>Electronic Commerce</p> <p>Electronic Publishing</p> <p>Environmental management</p> <p>Financing and Banking</p> <p>Healthcare Information</p> <p>Human Factors</p> <p>Insurance Management</p> <p>Knowledge Management</p> <p>Library Services</p> <p>Multimedia Technologies</p> <p>Research Libraries</p> <p>Techniques of IT-consulting</p> <p>Technology Management</p>

Table 1: Framework for Information System study programmes

Qualitative and Consolidated Results

In order to identify first indications of differences between study programmes in the UK and the German-speaking countries, we attempted to assign particular courses to our categories in the framework. Due to the heterogeneity of the courses, this proved to be very difficult. However, our quantitative analysis revealed some interesting results.

Despite the Bologna agreement³ the general degree structure is still very different. The German-speaking regions typically offer an integrated degree of 8-9 semesters. In the last few years some universities have changed to awarding degrees of Bachelor and Master. However the study programme is still structured as an integrated programme, which is designed so that graduates from the Bachelor degree can directly continue on the Master level. In the UK the Bachelor and Master programmes are more decoupled and thus allow more flexibility in changing universities and study focus. For instance some of the degrees are designed as conversion courses, which require no particular knowledge in Management or Informatics. In contrast, universities in the German-speaking regions mostly assume that students at the Master level have the same knowledge as the Bachelor Graduates from their own Business Informatics programme.

The term “Business Informatics” (Wirtschaftsinformatik) is widely accepted in business and academia in the German-speaking countries (nearly all degree programmes are labelled as “Business Informatics”). In the UK the term Information Systems or Information Management is often used. Table 2 illustrates some examples of degrees offered by universities in the UK.

MSc Analysis, Design and Management of Information Systems
MSc Business Administration (IT)
MSc in Advanced Computer Science with ICT Management
MSc in Information Management
MSc in Multidisciplinary Informatics
MSc Information and Knowledge Management
MSc Information Systems

Table 2: Examples of Degrees offered in the UK

Regarding the study effort, most universities in the German-speaking area provide information about the European Credit Transfer System Information (ECTS credits). In addition the study effort of courses is often calculated on lecturing hours per week per semester. Typically one hour of lecturing per week is translated to 1.5 ECTS credits. A ‘Diplom’ degree, which is still the norm, involves about nine semesters of study with about 250 to 270 ECTS, which includes about 40-60 ECTS for a Master-Diplom thesis. The thesis takes between 4-6 months. In the UK the study effort is provided as Credit Assessment and Tracking System (CATS) credits. Most universities require 160-180 CATS for a one-year Master programme. The Master thesis takes mostly about 4 months and accounts for between 40-90 CATS.

³ Reports regarding the current status of the higher education area of each EU member state can be found at: http://www.bologna-bergen2005.no/en/national_impl/05Nat_rep.htm.

In order to provide an indication of key subjects, we tried to identify some indicators by summarising typical study profiles (Although the number of study programmes involved does not allow a detailed quantitative analysis).

In contrast to Information Systems, Business Informatics appears to have a stronger focus on Mathematics, Logic and Structural Science, which includes Statistics and Operations Research. One reason for this could be the focus on the *systematic* construction and the application of methodological principles, which are often stated as typical for Business Informatics study programmes (Heinrich 2002, Gesellschaft für Informatik 2003, Retzer, Fisher and Lamp 2003, Disterer, Fels and Hausotter 2003). In this regard Business Informaticians are often described as information system architects (in the sense of engineers) who are actively and systematically analysing and designing business information systems. Indeed, in general mathematical principles are perceived as essential in order to systematically construct, formalise and analyse models and architectures of information systems (Henderson 2003).

It is also interesting to note that universities in both the UK and the German-speaking countries regard System and Software Engineering courses as important. Another indication of the importance of Programming in the study programme might be the proportion of Information and Communication Technology and Programming and Algorithms, Data and Object Structures courses in both UK and German-speaking regions. In addition most UK based degrees include a substantial course in Data Engineering.

Due to their characteristic as conversion programmes, and the more open study structure in the UK, fundamentals of Information Systems are generally given more weight in the UK in contrast to the more specific courses of principles of Business Information Systems in the German-speaking area. Another interesting observation is the stronger focus on Information Management in the UK. Courses in the German-speaking countries, on the other hand, appear to have more detailed courses in business (e.g. Accounting, Marketing, Logistics). However this specialisation in business subjects might be justified by considering the comparatively long study duration of nine semesters integrated curriculum as compared with a one-year continuative Master programme in the UK.

Nonetheless almost all Business Informatics degrees in the German-speaking countries offered particular and substantial courses in Accounting, Finance and Logistics (or Supply Chain Management) and included a course in Economics. In contrast the UK-based courses focused more on the alignment of Business Strategies and Information Technology (e.g. courses in Information System Strategy) as well as the management of Information Technology and technology-orientated teams. In addition, the UK based courses tend to have a high proportion of career electives courses, which might indicate the character of Master level degrees as specialisation level.

4 CONCLUSION AND FURTHER RESEARCH

This article presented a framework for structuring information systems study programmes in Europe. In addition, our article illustrated some differences between selected study programmes in Information Systems in the UK and the German-speaking area. Our results show that even in the context of the Bologna agreement the study programmes, nationally and internationally, are still very diverse and difficult to compare. The framework presented in this article provides the foundation for a more comprehensive analysis of European study programmes, which is planned as part of the ERASMUS-funded curriculum project BIN-Net. The BIN-Net project aims to develop a common degree in Business Informatics in Europe.⁴

In particular, for historical reasons arising from Diplom programmes of nine semesters duration, programmes in the German-speaking countries show a close integration between Bachelor and Master levels. In the UK the dependencies between Bachelor and Master level are more decoupled. Another result of our study illustrates that the term “Business Informatics” (Wirtschaftsinformatik) is commonly used and accepted in the German-speaking regions. In the UK the term Information Systems or Information Management is often used.

One of our main observations of this explorative study is the relatively strong emphasis on engineering principles in typical Business Informatics degrees, including Mathematics and Structural Science. In addition Logistics, Accounting and Economics as specific courses are part of most Business Informatics curricula in the German-speaking area. However, the sometimes-claimed stronger emphasis on aspects of integration in Business Informatics degrees and the particular holistic character of Business Informatics (Scheer 1998, Disterer, Fels and Hausotter 2003, Mertens 1998) could not be observed in the selected study programmes.

Nonetheless the emphasis on engineering principles, in addition to the subjects of Business, Informatics and Information Systems should facilitate an analytical and integrated approach. Indeed, the focus on engineering principles in Business Informatics could play an important role in future education programmes (Devlin 2003). However, the production of information managers, often expected in practice, is generally not the primary objective of Business Informatics (Heinrich 2002). In this context, Business Informatics could complement the management-orientated stream of the Information Systems discipline, which often focuses on the business and management aspects. Both business informatics and management-oriented information system courses are important and complementing each other.

In addition as study programmes in both the UK and German-speaking regions show, Information Systems are socio-technical systems, and graduates need a

⁴ The project BIN-Net: Business Informatics Network in Common Europe has been funded under ERASMUS project (ERASMUS – Joint Development of Study Programmes at intermediate and advanced level) within the SOCRATES Programme. The project aims to develop a joint-master degree in Business Informatics in Europe, which will be recognized by the partner institutions. Coordinated by the University of Vienna, project partners include Dublin City University, School of Technology of Setúbal, University of Economics Prague, University of West Hungary, Wroclaw University of Economics, Gdansk University of Technology, University „Lucian Blaga“ Sibiu, University Politehnica of Bucharest, Comenius University of Bratislava.

comprehensive understanding of behavioural aspects as well as Software Engineering, Programming and Information Technology. Interpersonal and communication skills as well as problem solving and critical thinking capabilities are essential for any Information Systems and Business Informatics graduate.

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APPENDIX:

List of Universities

University	Leading Faculty / Department	URL
University Bamberg	Business Informatics and Applied Informatics	http://www.uni-bamberg.de/wiai/
University Duisburg-Essen	Business	http://cms.uni-duisburg-essen.de/studienangebote/studienangebote_06640.shtml
University Erlangen-Nürnberg	Business Administration, Economics and Social Science & Engineering Sciences	http://www.wi2.uni-erlangen.de
University Linz	Information Engineering	http://www.winie.uni-linz.ac.at/
University Mannheim	Business & Informatics	http://www.bwl.uni-mannheim.de/Fakultaet/60/de/index.html
University Münster	Business Informatics	http://www.wiwi.uni-muenster.de/fakultaet/organisation/wi.html
University of Vienna / Technical University Vienna	Business and Informatics & Science and Informatics	http://winf.univie.ac.at/
University Saarland	Law and Business	http://www.uni-saarland.de/de/studium/studienangebot/wirtschaftsinformatik/
University St. Gallen	Information Management	http://www.iwi.unisg.ch
London School of Economics	Information Systems	http://is.lse.ac.uk/
Loughborough University	Information Science	http://www.loughborough.ac.uk/departments/is/
University Leeds	Computing	http://www.scs.leeds.ac.uk/
University of Central Lancashire	Business School	http://www.uclan.ac.uk/facs/lbs/depts/bim/index.htm
University of Liverpool	Science & Computer Science	http://www.csc.liv.ac.uk/
University of Manchester	Computer Science & Business School	http://www.cs.man.ac.uk/
University of Sheffield	Information Studies / Computer Science	http://www.shef.ac.uk/uni/academic/I-M/is/home.html
University of Wales - Cardiff	Business School	http://www.uwic.ac.uk/ubs

List of subjects in the German-Speaking Regions:

Accounting and Financing
Accounting and Trust management
Analysis
Analysis, Planning and Design and Implementation of Business IS
Automotive Management
Business IT
Business Application with Internet
Business Communication Systems
Business Engineering
Business Information Processing
Business Languages
Business Organization
Business Processes
Business Statistics
Business Strategy and IS
C#
Challenges in Business Informatics
Communication Engineering
Communication Systems
Communication Systems and Technology
Computer Supported Co-operative Work
Computing Architecture
Computing Architecture and System Software
Corporate Controlling
Corporate Policy
Cultural Informatics
Data & Knowledge Engineering
Data Management
Data Management (SQL)
Data Modelling
Data Structures
Data structures and programming algorithms
Data Warehousing
Database Systems
Database Technology
Decision Support Systems
Descriptive Statistics
Didactics in Business
E-Commerce / E-Business
Economics
Education science in Business
Energy Economy
Entrepreneurship
Environmental management
Financial statements and balances
Financing and Banking
Formal description of data and functional models
Formal Methods/Foundations of Informatics

Human resource management
Inductive Statistics
Industrial management
Information and Applications Systems
Information Engineering
Information Management
Information Systems (Informatics)
Information Systems and Software technique
Information Systems in Finance
Information Systems in Production Companies
Insurance Management
Intelligent Systems / AI
International Management
Interorganisational Systems
IS Architecture
IT Security
Java Computing
Knowledge Management
Knowledge Representation and Knowledge based Systems
Legislation and Law
Linear Algebra
Logic
Logic Programming
Logistics
Management
Marketing
Methods and Tools of System development
Mobile Computing and Engineering
Modelling: Techniques and Methods
Multimedia
Multimedia Technologies
Network Computing and distributed systems
Numeric
Operations Management
Operations Research
Operations Systems
Organization
Philosophy
Planning and Decision theory
Planning
Politics
Practical Informatics
Probability and stochastic
Process and Communication Modelling
Programming and Programming Languages
Programming Approaches and Algorithmic
Programming Languages and Compiler
Project Management
Public Administration
Quantitative Methods

Service Industry and digital media
Service Management
Simulations
Sociology
Software Development
Software Engineering
Software oriented Informatics
Software technique
Statistical Data analysis and Data Mining
Statistics
Strategy
System Development and Database Systems
System development and IT-Management
System oriented Informatics
System platforms
System Programming
Taxation
Techniques of IT-consulting
Theoretical informatics
Web Engineering
Workflow Systems

List of subjects in the UK

Academic and Research Libraries
Advanced Database Technologies
Algorithm Design and Implementation
Analysis and design
Applications of Information Technology
Automating End User Systems
Biochemistry and Molecular Biology
Business Ethics
Business Information
Business Information Management Systems
Business Information Systems Techniques in Organizations
Business Simulation Modelling
Collaborative Internet Architectures and Systems
Communication, Visualization, and Interaction
Competitor intelligence
Computational Modelling
Computer and Network Architecture
Computer Architectures
Consumer health information
Culture and change management
Data Collection and Analysis
Database and 4th generation languages
Database Design

Database Structure and Design
Database Structure and Management
Decision Analysis and Decision Support Systems
Design and Authoring for the WWW
Design and Manufacture
Distributed Information Systems
E-Business
E-Business and E-Commerce
E-Business technologies
E-Commerce
Education
Educational Informatics
E-Government Information
Electronic Commerce
Electronic Publishing
E-Publishing: Design and production
E-Publishing: Marketing and business issues
Foundations for Object-Orientated Programming
Geography
HCI and Graphical Interfaces
Health
Healthcare Information
Human Computer Interaction and User Interface Design
Human Information Processing
Informatics and knowledge management systems
Information and knowledge management in the NHS
Information and Society
Information architecture
Information Management in Organizations
Information Needs Analysis
Information retrieval for knowledge management
Information Searching and Retrieval
Information Storage and Retrieval Research
Information Systems
Information Systems Analysis and Implementation
Information Systems and organization
Information Systems and the Information Society
Information Systems Development Methodologies
Information Systems Management
Information Systems Modelling
Information Systems Project Management
Information Systems Strategy and e-Business
Information Technology: Issues and Skills
Innovation and Technology Management
Intelligent information systems
Interaction design
Interactive System Design Methods
Interdisciplinary feasibility study
Internet and Intranet technology
Interorganisational Information Systems

Interpretations of Information
Introduction to Computer Systems
Introduction to Systems Thinking
IT Change Management
IT Policy and Development
Java and UML for Programmers
Java E-Commerce
Legal context of information and knowledge management
Library Services for Children and Young People
Management II: Human Resource Management
Management of innovation and entrepreneurship
Management of the IS function
Management Science
Management techniques and people skills
Marketing for Information Professionals
Markup Languages for the WWW
Multi-Agent Systems
Multimedia
Multimedia and human-computer interaction
Network Architectures
Object Oriented Analysis and Design
Object Oriented Methods
Object-Oriented Programming in Java
Object-oriented systems
Organization, Management and Information Systems
Practical Computing
Principles of Information Retrieval
Principles of knowledge
Principles of Privacy and Data Protection
Principles of Research Design
Professional development skills
Professional Issues
Professional studies
Public Libraries
Records Management: Electronic Records
Records Management: Principles and Systems
Research Methodology in ILS
Research Methods and Dissertation Preparation
Research Skills and personal Development
Security in Information Systems for Organizations
Software Analysis and Design
Software Engineering
Strategic Management and Information Systems
Studies in Management
Systems Design in Context
Systems Development
Topics in IS (Global Consequences of IT, Knowledge, Organization and Technologies, E-Government)