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Computing (formerly Software Systems) Framework

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Overview

- Some issues in Computing/IT degree level provision.
- Computing at Bournemouth (rationale and ethos)
- The Computing Framework and contents
 - Current courses, ethos and structure
 - Year One & Year Two
 - Placement
 - Final year units
 - Projects
 - The student experience
- Careers open to our graduates.
- *Reflections on our rationale and experiences (why we have taken these approaches).*

Issues in Computing/IT degree level provision

- Breadth and diversity of the subject area.
 - Computing means different things to different people.
 - Different experiences of prospective applicants
 - Much mis-information (and disagreement) about employment prospects. Our observations.
- Computer science degrees versus more professionally oriented degrees.
- Business IT degrees – how these vary.
- Why students choose to study on Computing/IT degrees.

Breadth and diversity of the subject area.

- Computers today penetrate every aspect of our lives
 - Databases and other software used in businesses and organisations
 - The internet and the World Wide Web
 - Embedded programmes that control our mobile phones, washing machines and car engines.
- Implies the need for Computing/IT professionals to **specialise**.
- But it is difficult for a school or college leaver, when choosing a university Computing/IT course, to know in which area(s) to specialise.

Computer Science v. other types of computing/IT degrees

- “Traditional” Computer Science degrees
 - Theoretical
 - Draw on mathematical disciplines
 - Suit a particular type of student.
- More professionally oriented computing/IT degrees
 - Focus more on the **practical application** of computing/IT
 - Aim to prepare students for employment in the industry
 - Suit a broader range of students.
- Happy medium – rigour with practical experience.



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Variation in Business IT degrees

- Many universities offer degrees with this or similar titles.
- Great variation in the proportion of business studies to technical studies on such courses.
- Provision on a spectrum of relative proportions
 - At one end, 70-80% business and 20-30% technical.
 - At the opposite end (us!), 20-30% business and 70-80% technical.
- It is important for students to know about this, as not all students can, or wish to, cope with the technical demands of the more technical courses.

Why students choose computing/IT degree courses

- They have a deep interest in, and fascination for, computers and what can be done with this technology.
 - The “geeks” (how we love them!)
- They understand that there are always good jobs for graduates in computing/IT disciplines.
- They, or their parents, believe that they need a degree of some sort for a successful future career
 - They quite enjoy **using** computers – to surf the net, play computer games, use social networking sites, etc. So why not choose a computing/IT degree?

Computing at Bournemouth

- Industrially relevant education, underpinned by research and enterprise, on accredited courses (*all in framework*) with excellent employability prospects
- We have always had a focus on the professions.
- For example, were among the first to have courses focussed on Software Engineering & Business IT (as opposed to Computer Science).
- Our current frameworks and courses still address professional practice, and reflect the breadth of the Computing industry with their specialisations, whilst being informed by our **research and enterprise activity**.
- We continue to review and refresh our provision to ensure its currency and value.



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Some BU Research Themes

- ***Things that matter to the profession***
 - Requirements Engineering
 - *Process modelling*
 - *Alignment of Business and IT*
 - Software Systems and Modelling
 - Model Driven Development
 - Software Development Methods (recent KTP projects)
 - Systems of Systems (coming funded project)
 - Automotive Software Engineering (with Bosch)
 - Software Process and Quality
 - Web Systems and Web Development Methods
 - Complex Adaptive Systems (with STRC as part of INFER)
 - Artificial Intelligence, Natural Computing, Data Mining
 - Information Assurance, IT Security.



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Some Recent Research

- **Development Methods for Rich Internet Applications (KTP)**
- Methods to address the particular needs of these kinds of development projects, in terms of product capability and reliable development processes.
- **Reverse engineering whilst retaining tacit Process Knowledge (KTP)**
- Aside from the architectural re-engineering challenge to extract and describe business rules & processes to inform specification of new software products.
- **Meta-model-based merging: to Support Distributed Model Based Software Development for automotive product lines (with Bosch)**
- Our model merging uses a novel (meta model driven) approach to ensure that much of the meaning (from the modellers' perspective) is preserved.
- **Visual Model Driven Programming (VIDE)**
- A rich and accessible tool-set, allowing those who are not IT specialists to be involved in the description and specification of system behaviour, as part of an MDA process.
- **A naturally inspired guidance system for unmanned autonomous vehicles employed in a search role**
- Method for improving the performance of autonomous vehicles operating in a search role. A number of journal outputs, one of which gained a best paper medal (presented by HRH the Duke of Edinburgh, to the authors, Banks, Vincent and Phalp) in 2010.

What is the Computing Framework?

- A set of 7 related computing/IT degree titles.
(note change from prospectus)
- **Deferred choice of final degree title.**
- Common first year of study.
- Partial specialisation in Year 2.
- Industrial Placement (Year 3).
- Final year
 - Choice of degree title and taught units.
 - Individual project and dissertation.

Degree Titles in the Computing Framework

- **IT-with-business degrees**
 - BSc (Hons) Business Computing
 - BSc (Hons) Business Information Technology (aka “BIT”)
 - BSc (Hons) Information Technology Management
- **Computing degrees**
 - BSc (Hons) Computing
 - BSc (Hons) Software Engineering
- **Forensic/Security degree**
 - BSc (Hons) Forensic Computing & Security
- **Networking degree**
 - BSc (Hons) Network Systems Management

Framework ethos and focus

- A range of degree titles reflecting the breadth of the profession
 - Deferred choice of degree title allows informed choice, specialisation, and changes of direction, up to the final year.
- Industrially relevant education, underpinned by research and enterprise, on accredited courses with excellent employability prospects
 - Our courses have always had a practical and professional emphasis (as opposed to Computer Science)
 - Course content and teaching are informed by the research and industrial activities of our staff.
- Common first year, and common units in second year, ensure coverage of core topics, necessary for accreditation with professional bodies.

Year One - Units & Assessment

Six taught units, studied by all first year students:

- Computers & Networks
- Databases
- Programming
- Systems Analysis & Design
- Web & Media Development
- Business & Professional Issues

- Assessment for most units is 50:50 coursework:exam.
 - Coursework – individual and group work.

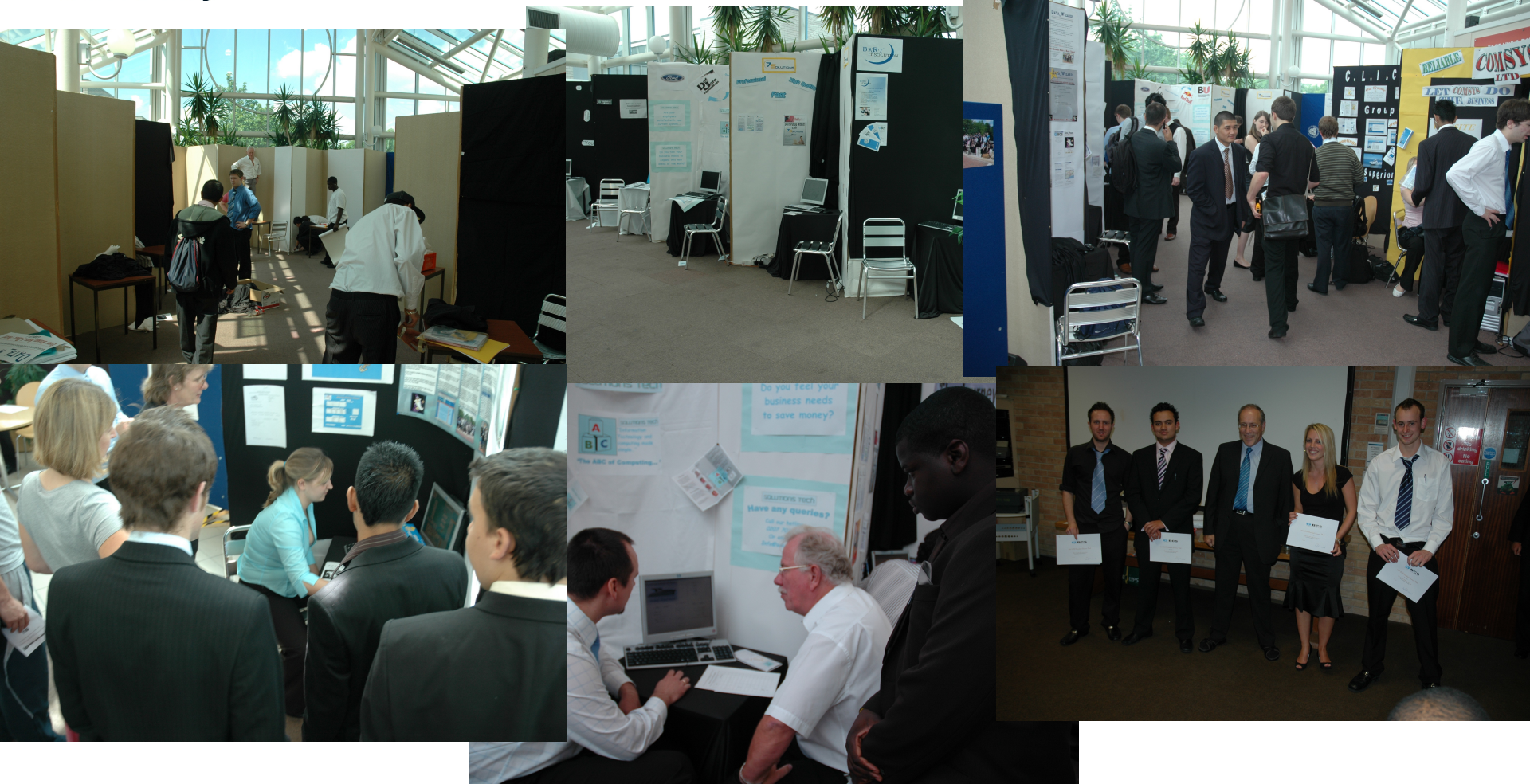
The First Year Experience

- For each unit, normally:
 - A one-hour lecture per week.
 - A one-hour seminar or lab session, in smaller groups (more for programming)
- Modern, well-equipped computer labs, open 24 hours a day, 7 days a week.
- First year tutors, for academic and pastoral care.
- Peer-Assisted Learning (PAL) scheme in operation.
- Integrating all the first year learning – Simulated Business Week
 - Practical group work on a development project.

Integrating the learning



Integrating the learning



Year 2 - partial specialisation

Units	Bus IT	Comp	Forensics	Network
Business Context	Core			
Data Management	Core	Core	Core	Core
Digital Forensics			Core	
Ethical Hacking & Counter-			Core	Core
Games		Option		
Integrating Team Projects	Core	Core	Core	Core
Networks and Security	Core	Core	Core	Core
Programming 2	Option	Core	Option	Option
Systems Design	Core	Core		Core
Web Development e-business	Option	Option	Option	Option



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Placement Year

- **Very** important part of the course
 - Puts into practice what has been learned in the first two years
 - Provides valuable industrial experience
 - Gives a competitive edge in finding a job after graduation.
- Placements last a minimum of 40 weeks
 - **Paid** positions, with large or small companies, in UK or abroad.
- Our Placement Service helps students find and apply for suitable placements
 - Also provides supervision while on placement.



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Typical placement and graduate employers

- Adido Solutions
- CISCO Systems
- County Councils (various)
- DEK Printing Machines
- Disney
- Estee Lauder
- Google UK
- House of Fraser
- IBM
- Intel
- Lockheed Martin UK
- J P Morgan
- Microsoft UK
- Micronav
- Ministry of Defence
- Nationwide Building Soc
- NHS
- Oracle Corporation
- Quinetic
- School / College IT
Departments (various)
- Siemens
- Xerox



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Final Year (Year 4)

- Students enter Year 4 having made their final choices of degree title and the final year taught units they wish to study.
 - These choices are inter-related, most titles mandating certain electives.
 - However, there are two generic degree titles (Computing and Business Information Technology) that allow a more eclectic choice of units.
- The final year is organised into two semesters:
 - Semester 1 (October to mid-January)
Study 3 taught elective units, with exams in early January.
 - Semester 2 (late January to May)
Work on individual project/dissertation.



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Current Final Year Taught Units

- Advanced Data Management
- Advanced Development
- Advanced Networks
- Business Development and Enterprise
- Business Processes and Requirements
- Cyber Crime
- Digital Entertainment Systems
- Information Assurance
- Management in Computing
- Network Configuration Management
- Software Quality and Testing
- Software Systems Modelling
- Web Systems



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Final Year Project

- The individual project is a triple-weighted unit (60 credits)
- Project involves a combination of theoretical and original practical work, related to the chosen degree title
 - Students choose an area of development and research relevant to their interests and career aspirations
 - Project ideas may arise from placement experience, taught units or suggestions from members of staff.
- Deliverables (typical)
 - Dissertation and development documentation
 - System demonstration.
- Project Tutor and individual Project Supervisor.



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Graduate jobs open to our graduates

- Programmer
 - Many different types of applications (e.g. web applications, mobile phones, games, embedded, etc)
 - Many different programming languages
- Database developer, database administrator, data manager.
- Software engineer or software developer
 - Systems analyst, requirements engineer, systems designer, software tester.
- Networking – network designer, network manager.
- IT support – computers, networks, users.
- IT project management – team leader, project manager.
- IT teacher or trainer
- IT sales consultant

Our graduates 2-10 years on ...

Android Developer	Software Engineer
Business Analyst	Senior Analyst Programmer
Development Manager	Senior Information Analyst
Enterprise Architect	Senior Oracle Developer
IT Manager	Software Project Manager
Lead Web Developer	Systems Analyst
Managing Director	Technical Consultant
Network Analyst & Mobile Specialist	Technical Director
Network Engineer	Test Team Leader
Online Marketing Consultant	Usability Manager
Pre-sales Support Engineer	Web Development Manager



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