

**MODULE / COURSE-UNIT PROPOSAL FORM** (revised Aug04)



Registry use only:

Module/course-unit code	Received	DC approval
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**N.B:** In developing the module/course-unit, account should be taken of relevant QAA Benchmarking Statements and, where appropriate, the requirements of Professional and Statutory Bodies.

1. Title <small>(see footnote<sup>1</sup>)</small>	2. Value	3. Level	4. Duration		
Mobile and Ubiquitous Computing	e.g. 0.5, 1.0, 2.0 cu <b>0.5</b>	Please see footnote <sup>2</sup> M	Number of terms 1		
<b>5. School responsible for this module/course-unit</b>	<b>6. Programme(s) of which the module/course-unit forms part (insert * by the title for a new programme). Please indicate the total number of modules/ course-units for each programme and specify to which programmes it is a core and to which programmes it is an option and in which year(s) of the programme it is offered.</b>				
Computer Science and Information Systems	MSc in Advanced Information Systems MSc E-Business Technology MSc by Research in Computer Science				
<b>7. Date module/course-unit will commence</b>	<b>8. Maximum/minimum number of students per intake</b>				
October 2005	Maximum:30 FT, 30 PT  Minimum: 10 FT, 10 PT				
<b>9. Pre-requisites and/or Restrictions</b>					
<p><i>Restrictions may include modules/course-units only being available to students studying a particular programme or modules/course-units which cannot be taken in conjunction with this one.</i></p> <p>Prerequisites: A first course in networks and a first course in software engineering (e.g. as taught in a typical U.K. undergraduate degree in computer science, or on a general MSc in computer science) Co-requisites: none</p>					
<b>10. Teaching and Learning Methods</b>					
<p>Indicate the total contact hours* the student will spend in:</p> <table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <b>Lectures:</b> 11   <b>Seminars:</b>   <b>Tutorials:</b> </td> <td style="width: 50%; vertical-align: top;"> <b>Field Work:</b>                      (Please also state here: number of trips; group or independent; location and duration of; resources/equipment required)   <b>Practical Classes: 22</b>                      (labs, computers, languages)                 </td> </tr> </table>				<b>Lectures:</b> 11  <b>Seminars:</b>  <b>Tutorials:</b>	<b>Field Work:</b> (Please also state here: number of trips; group or independent; location and duration of; resources/equipment required)  <b>Practical Classes: 22</b> (labs, computers, languages)
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<sup>1</sup> Where a module/course-unit is being developed as part of a new programme, this form should be submitted with the Programme Proposal/Programme Specification Form.

<sup>2</sup> This section should detail the level of the module/course-unit in accordance with the qualification levels which are described in the Framework for Higher Education Qualifications, which can be found at: <http://www.qaa.ac.uk/crntwork/nqf/ewni2001/contents.htm>. Modules/course-units on Masters degrees, Postgraduate Certificates and Postgraduate Diplomas should be designated as level M (Masters). Modules/course-units on Foundation degrees should be identified as either level C (Certificate) or level I (Intermediate) and those on Bachelors degrees with Honours should be designated as level I (Intermediate) for introductory modules/course-units (usually years 1 and 2) and level H (Honours) for work in the final two years of the programme.

<b>Project Work:</b>	<b>Other (please specify):</b>
<p><i>Typically one module/course-unit should involve between 24 and 36 contact hours per term, depending on subject and on learning and teaching methods.</i></p>	
<b>11. Main aims, special features and rationale</b>	
<p><b>Main Aims</b></p> <p>The main aims of the module are:</p> <ul style="list-style-type: none"> <li>– to study the novel aspects of mobile, ubiquitous and pervasive computing systems</li> <li>– to study the principles, research problems and applications of sensor networks</li> <li>– to acquire a range of design skills for software development in mobile and ubiquitous computing</li> <li>– to acquire systems development experience with existing mobile and ubiquitous computing technologies</li> <li>– to help students develop self-study skills so that they can keep up with the rapidly changing technologies, tools and techniques in the area</li> </ul> <p><b>Special Features</b></p> <p>Students will work in groups to prototype specific mobile or ubiquitous computing systems as part of their project work which will help focus learning activities of targeted application areas.</p> <p><b>Rationale for introducing the module/course-unit in the context of existing provision including statement of how this proposal meets student needs.</b></p> <p>[a. If the proposal supersedes an existing module/course-unit please give the title and code of the superseded module(s)/course unit(s) and the reason for replacement.]</p> <p>[b. If the proposal relates to an existing module/course-unit please give the title and code of the related module(s)/course unit(s) together with an explanation of how this relationship will work.]</p> <p>Over the last five years, mobile and ubiquitous computing has emerged as a critical component of information and communications technologies. This module is introduced to compliment the selection of advanced technologies currently included in the advanced MSc programmes of the School of Computer Science and Information Systems.</p>	
<b>12. Learning Outcomes</b>	
<p><b>Please note:</b> The learning outcomes should relate to the overall aims of the programme(s) to which the module/course-unit forms part.</p> <p>Students who have taken the module/course-unit should be able to demonstrate the following knowledge, skills and understanding:</p>	
<p><b>Subject Specific</b></p> <ul style="list-style-type: none"> <li>– To familiarize with the technologies employed in the development of mobile and ubiquitous computing systems.</li> <li>– To understand information management techniques in highly resource constrained environments</li> <li>– To use in practice and evaluate routing and scheduling algorithms</li> <li>– To develop software for resource constrained devices</li> <li>– Ability to analyse mobile computing systems requirements</li> <li>– Ability to develop appropriate solutions for the management of appropriate mobile computing systems</li> <li>– Ability to compare different data dissemination algorithms taking into account the device distribution, the query workload and the sensor data traffic.</li> </ul> <p><b>Intellectual</b></p> <ul style="list-style-type: none"> <li>– Capacity to identify and formulate learning needs and plan learning.</li> <li>– Extracting and evaluating relevant and important information from published work</li> </ul>	<p><b>Practical</b></p> <ul style="list-style-type: none"> <li>– Ability to install, manage and develop with the TinyOS operating system running.</li> <li>– Ability to define and execute network simulations</li> <li>– Ability to development of a variety of sensor network applications, e.g. habitat monitoring, environmental, agriculture, surveillance, and emergency applications.</li> <li>– Software design skills and programming skills for ubiquitous computing applications</li> </ul> <p><b>Personal and Social</b></p> <ul style="list-style-type: none"> <li>– Learning how to learn in the context of rapidly changing technologies, tools, techniques and methods.</li> <li>– Working within a group.</li> <li>– Maintaining Learning Log to record problems encountered, results of analysis, sources of information and advice, potential solutions tested, final solution implemented and lessons learned.</li> <li>– Self study skills – searching for and extracting information from a variety of sources including presentations, internet searches, generic on-line</li> </ul>

<ul style="list-style-type: none"> <li>- Ability to analyse and design systems for resource constrained components</li> <li>- Ability to design systems for appropriate interaction with ubiquitous computing systems</li> </ul>	tutorials, research papers and in-built tutorials.
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**13. Syllabus**

One-term module, 11 weeks, 3 hours per week

**Assessment:** by written examination and practical project work. The final module mark will be 80% of the exam mark attained and 20% the mark of the project.

**Syllabus:**

- *Mobile networking.* Types of mobile networks. Mobile network architectures. Cellular telephony. Mobile ad-hoc networks. Routing. Mobile IP.
- *Software development for mobile devices.* Requirements of small form factor devices. Web based technologies. Mobile Java. Mobile Grid and collaborative processing with Jini.
- *Physical-electronic integration.* Augmenting physical artifacts, Radio frequency identification. Tangible interfaces. Interactive displays.
- *Sensor and actuator networks.* Platforms and capabilities. Programming sensor networks. Sensor databases: in-network query processing and storage management. Routing and MAC-layer algorithms. Localization and synchronization techniques. Introduction to development with TinyOS.

**Background Reading:**

Uwe Hansmann, L. Merck, M.S. Nicklous, T. Stober, P. Kahn, M.T. Oszu, P. Valduriez  
Pervasive Computing Handbook  
Springer-Verlag, 2001, ISBN: 3540671226

Feng Zhao, Leonidas Guibas, Wireless  
Sensor Networks: An Information Processing Approach  
Morgan Kaufmann, 2004, ISBN: 1558609148

George Roussos  
Ubiquitous and Pervasive Commerce  
Springer SMB, 2005

**14. Scheme of Assessment**

Assessment methods which enable the student to demonstrate the learning outcomes for the module.

**Elements of assessment include: Coursework (essay, report, classroom exercises), Dissertation, Project, Written Paper (seen, unseen, take away, multiple choice, other), Presentation, Practical, Orals, Fieldwork.**

Element of assessment	Weighting	Characteristics (eg, word count, duration, date)
Written Examinations	80%	
Project	20%	
<b>Total:</b>	<b>100%</b>	

**Rationale:**

**Pass requirements (i.e. all elements have to be passed, some elements must be passed as well as a pass overall, or just a pass overall must be obtained?)**

A pass overall must be obtained.

**Will there be any special arrangements for re-assessment?**  
 Project marks can be carried forward to the following year.

**15. Teaching Staff**

Name	FT or PT	School
<b>Module/Course-Unit Coordinator:</b> Dr George Roussos, FT, School of Computer Science and Information Systems		
<b>Birkbeck teaching staff:</b> Dr Agathoniki Trigoni, FT, School of Computer Science and Information Systems		
<b>Sessional teaching staff</b> (Please supply an up to date c.v. of all sessional teaching staff)		
<b>Include details of any technical staff required</b>		

**16. Additional Resources Required\***

**Please identify any additional resources required. Please note that the teaching and learning must be sufficiently flexible to enable all reasonable adjustments to be made in accordance with the Disability Discrimination Act (DDA).**

\* If new module/course-unit can be managed with existing resources, write 'NIL' against the appropriate headings.

**Accommodation**

**Library** (Please attach a list of the core texts and a short indicative reading list as a guide (max. half a page))

Have you discussed library provision for the module/course-unit with your subject librarian? **Yes / No**

**Computing**  
 Have you discussed any requirements for the use of specific software packages with CCS technical support staff?  
**Yes / No**

CCS

School

**Please state requirements for any other resources.**

**17. Agreement**

	Name	Signature	Date
<b>Author of this proposal</b>			
<b>Module/Course-Unit Coordinator</b>			
<b>Head of School</b>			
<b>Dean of Faculty</b>			
<b>Librarian</b>			
<b>Comments</b>			

CCS Manager			
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**CLOSING DATE: 1 MARCH** PRECEDING THE SESSION IN WHICH TEACHING WOULD BEGIN. YOU MUST ALSO OBTAIN **ALL** OF THE ABOVE SIGNATURES BEFORE YOU SUBMIT THE FORM.

**Please return the form to the Assistant Registrar (Registration and Regulations).**