School and Subject Group		School of Engineering and Applied Science, Electronic Engineering	
Module Code		EE7003	
Module Title		Sensing Networks	
Module Type		Taught	
Date of introduction of new module		2010	
Level		7	Credit Value 10
Programme(s) in which module is available		MSc in Sensing	
Involvement of Other Schools		None	
Resource Split			
Name of Module Co-ordinator		Dr. John A.R. Williams	
Name of Module Advisor		Dr. Kate Sugden	
Related Modules	Pre-requisites	None	
	Co-requisites	None	
	Prohibited Combinations	None	
Minimum and Maximum Intake Sizes		None – None	

Aims of the Module
To provide an overview of the applications, characteristics, platforms and data processing requirements of wireless sensor networks.

Summary of Content

1. Applications
   (a) Area Monitoring
   (b) Environmental Monitoring
   (c) Industrial Monitoring
2. Characterisitics
   (a) Power limitations and challenges
   (b) Ability to withstand harsh environmental conditions
   (c) Coping with node and communication failures
   (d) Node mobility, dynamic network topology and heterogeneity of nodes
   (e) Large scale deployment and unattended operation
   (f) Scalability and bandwidth requirements
   (g) Lifetime maximization, Robustness and fault tolerance, self-configuration
3. Platforms
   (a) Standards: ZigBee, WirelessHART, 6LowPAN, ISA100 and IEEE 1451
   (b) Sensor Node Hardware
   (c) Software: TinyOS, middleware - distributed database, mobile agent and event based approaches
   (d) Programming Languages: nesC, Labview
4. Simulation
   (a) TOSSIM and n-2

Summary of Methods and Frequency of Teaching	**Lectures** 18 hours. **Laboratory** 12 hours. Ad-hoc wireless network simulation

Summary of Methods of Assessment and Feedback including Formative Feedback

Assessment Type	*Status*	*%*	*Requirements*	*Due*
Laboratory	Compulsory	40.0	Simulation and optimisation of a wireless network, assessed by report Feedback given to individual students via online form	-
Formal Examination	Compulsory	60.0	2hr formal examination Marks released via local online grades page prior to examination board.	-

Module Outcomes - what the student should gain from successful completion of the module:	Learning and Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated	
	Learning and Teaching Methods	Assessment Methods
A. Knowledge and Understanding		
Marks released via local online grades page prior to examination board.	Laboratory, Lectures	Formal Examination, Laboratory
B. Intellectual Skills		
convey complex ideas in a structured scholarly manner and to perform independent work in problem solving	Laboratory	Laboratory
C. Professional Skills		
D. Transferable Skills		

Please provide either or both of:	
(i) Introductory Learning Resources	Online tutorials and Blackboard
(ii) Core Texts	To be confirmed
Reading Lists	Attached
Specification completed by:	Prof. Keith J Blow
Date	22-Dec-2009
Date module approved by Teaching Committee(s)	
Date module approved by School Board(s)	