Engineering Principles
Systems & Control

Tuesday 23rd November 2010
9.30 to 3.00pm
The Pavillion, CURTIN UNIVERSITY, BENTLEY
Visitor parking Car Park 3, off Townsing Dr

Open to AISWA, CEO and DET teachers, Cost $120
(Includes morning tea and lunch)

Register by 5th November 2010

For more information please contact: Paul Moro: (pmoro@ais.wa.edu.au) 9441 1673

Presenter: Dr Jonathan Paxman (Senior Lecturer of Computer Engineering, Curtin University)

Jonathan Paxman obtained PhD and MPhil degrees in Control Systems Engineering from the University of Cambridge in 2003, and subsequently worked as a Research Fellow at the Centre for Autonomous Systems in Sydney. He joined Curtin University in 2007 as Lecturer in the Department of Mechanical Engineering, and is currently Program Leader for the Bachelor of Mechatronic Engineering.

(See page 2 for further details)

Please Note: Registrations for all AISWA PL events are submitted on-line via the AISWA website www.ais.wa.edu.au

Not an AISWA member?
Click on Non Members click here tab
Select the month of PL event
Locate the event by scrolling through the list and click the Register tab
(please be aware pop-up screens need to be active and not blocked).

Like to Register for AISWA’s Website?
Click ‘Login’ (found on left hand side of screen).
Select ‘Teacher Login’, then click on ‘Not yet registered?’
Follow prompts.
Once approved by your school, your password will be sent via email.
Only staff of AISWA member schools can apply for LOGIN

Already AISWA registered?
Click on “Login”
Choose your “Account” (Head of School/Teacher/Authorised user)
Enter your email address & password
Click PL Calendar on right-hand side menu then choose month of your PL and scroll through list.
You will receive an email confirmation if you have registered correctly.

PLEASE SIGN THE ATTENDANCE SHEET
We rely on your signature to be able to credit you with PL hours, and failure to sign in may result in you being billed for non-attendance.

Please retain your email confirmation as both your schools invoice and your personal WACOT PD record. Certificates not given

Should you need to CANCEL please do so by 5th November. Email thogan@ais.wa.edu.au to cancel.
Failure to do so will incur a charge for you or your school.
Professional Development Workshops

This is a practically oriented workshop, where participants will edit and download code to control a small mobile robot using a microcontroller, DC motors, push buttons, and infrared sensors.

On completion of this module students should be able to demonstrate achievement of the following learning outcomes:

- Describe the structure of a control system, correctly applying the terms sensor, actuator and (micro)controller
- Compile and download high level code onto a microcontroller
- Test and debug embedded controller code
- Explain the difference between interrupts and polling as a way of processing events
- Use PWM signals to drive DC motors via an H-bridge

Content

- Sensors, actuators and microcontrollers
- Programming, compiling, downloading and testing high level code for device control
- Controlling DC motors via H-bridge and Pulse Width Modulation (PWM)
- Using interrupts or polling to process events (e.g push button presses)
- Analogue to digital converters (ADC)

Laboratory work

- Program and test a microcontroller controlled mobile robot
- Design a simple program for a mobile robot to avoid obstacles
- Use PWM and H-bridge to control DC motors
- Use ADC to interface with infrared range sensor
- Use an oscilloscope to view PWM signals