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Dear D&T PGCE Student

PGCE in Design & Technology; Subject Knowledge Booster Courses 2008/9

The University of Manchester are able to offer D&T subject knowledge booster courses as detailed below.

Materials

Course content includes; General workshop safety, Graphics, material processes, 2D CAD, 3D CAD, CAM, product design.

Successful completion of the course can lead to the DATA teachers' Health and Safety accreditation as well as accreditation under the CAD in Schools Scheme (<http://www.cadinschools.org>) that provides you with access to modern 3D CAD software.

Electronics and Communication Technology

Course content includes; Systems thinking, Electronics concepts, New and modern materials and components, Developing and designing electronic circuits, Testing electronic circuits, Manufacturing electronic circuits, Uses of ICT in circuit design (CAD), Uses of ICT in circuit manufacture (CAD/CAM), Control systems, Microcontrollers, Programming control systems, Robots, Incorporating electronics in other material areas, Product design issues, Developing teaching activities.

This course leads to accreditation under the Marconi ECT Scheme (<http://www.marconiect.org/>).

These are free* (though you will need to pay small sums for each professional accreditation applied for) 10-day (each area) courses and take place outside normal PGCE course timetables (i.e. on Saturdays or during school holiday periods). See below for dates. The courses are designed to help you ensure that your subject knowledge, in the two areas in which you will be teaching, is sufficient to meet the standards in a document called "Minimum competences for students to teach design and technology in secondary schools" that you will, during your PGCE course, be assessed against. Importantly, the courses also provide access to accreditation under three important schemes in D&T.

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* There will be a returnable £50 deposit for each booster for all external applicants

To apply, complete the attached application form.

Materials*-Course Dates: August 26, 27, 28, 29, September 8, Oct 21, 22, 23, Feb 16, 17.

Electronics and Communications Technology*-Course Dates: September 1, 2, 3, 4, 5, 9 January 5, 6, 7, 8

*note some dates may have to change at short notice

Best wishes,

David Spendlove
D&T PGCE Subject Leader

Subject Knowledge Booster Courses Design and Technology 2008-9

Booster application form

Please email one copy and post one copy of your application form to:

David Spendlove
School of Education
The University of Manchester,
Oxford Road,
Manchester M13 9PL
David.spendlove@manchester.ac.uk

Applicants Name:

Applicants email address:

Applicants contact telephone number:

Details of application to PGCE course

GTTR number _____

Course applied for _____

Institution _____

Contact _____

Please indicate yes/no as appropriate

- 1 I have been offered a place on the PGCE Course for September 2008 and:
- | | |
|--|--------|
| a) the offer is <u>conditional</u> on completion of a subject knowledge booster course | Yes/No |
| or b) I have been <u>recommended</u> to attend a subject knowledge booster course | Yes/No |
| or c) I would like to boost my subject knowledge before starting the PGCE course | Yes/No |
| d) I am available and will attend all the dates listed for the chosen area | Yes/No |

Please indicate which booster you wish to be considered for:

Materials

ECT

Both

Academic Qualifications

Details of First degree or equivalent

Award Title	Class	Name of Institution	Date

Other relevant qualifications (GCSE or above)

SUBJECT	Level	Grade	Year

Please give details of any other relevant experience

Please give details of any **Special Needs** or support required as a consequence of any disability

Declaration: I confirm that, to the best of my knowledge, the information given on this form is correct and complete.

Signature _____ **Date** _____

Please complete and return your application by email to David Spendlove
david.spendlove@manchsester.ac.uk

Confirmation of your place on the course will be sent to you by 4 August 2008.

Audits

The subject knowledge elements of Design and Technology are enormous and often when trainees realise what is required they can feel quite worried about how much there is to learn. This is however the reason for the boosters and although when completing the audits (below) you will begin to realise how much there is to learn, it should be reassuring that the booster can provide up to 20 days to enhance a lot of the areas below. In addition to this, anything that you can do to address any of the areas of limited understanding (identified from the audit) prior to the start of your course will be an advantage.

The audit will be used as part of the selection process for attendance on the booster.

Please complete the audit for the booster you have been recommended to attend. Please place X in the box that represents your current area of capability.

Audit ECT

Competencies	No understanding	Some understanding	Good understanding
E.M.3.1 construct and test simple circuits using stripboard and/or printed circuit board;			
E.M.3.2 use a computer and interface box, or microcontroller module, with appropriate electronic sensors and actuators;			
E.M.3.3 use appropriate computer software to design and make printed circuit boards (PCBs);			
E.M.3.4 prototype simple mechanical solutions incorporating cams, levers, gears and pulleys using both made and bought elements;			
E.M.3.5 analyse the manufacture of a range of mechanical, electrical and electronic products in terms of how the manufacturing processes and materials enable production at an appropriate			
E.M.3.6 use systems based understanding to check the operation of a manufactured circuit.			
E.K.3.1 understand that mechanical, electrical and electronic systems can be interconnected to achieve different purposes;			
E.K.3.2 describe feedback as a signal loop in a system diagram and understand how it is used in control systems to ensure that operations are achieved successfully (e.g. limit switches);			
E.K.3.3 understand the use of potential divider circuits with sensors and use them in switching circuits;			
E.K.3.4 understand that data can be transferred across a distance both with and without wires;			

E.K.3.5 use programming software to control simple products;			
E.K.3.6 use programming software to program a microcontroller for simple stand-alone control;			
E.K.3.7 use truth tables to describe and solve simple logic problems;			
E.K.3.8 understand the use of resistors and determine their values using the colour code; understand the basic units of electricity and use the resistance equation to calculate current, voltage and resistance within a variety of circuits;			
E.K.3.9 appreciate the need for and requirements of structures in the construction of mechanical and electromechanical systems;			
E.K.3.10 describe a range of simple mechanical devices and drive systems; describe the forms of mechanical movement and the use of mechanisms to translate between them;			
E.K.3.11 discuss the social and environmental consequence of using new technologies.			

Materials Booster

Competencies	No understanding	Some understanding	Good understanding
M.D.3.1 accurately sketch construction details which show how wood, metal and plastics can be used to make artefacts, including freehand sketching;			
M.D.3.2 accurately draw construction details using formal drawing techniques, to show how wood, metal and plastics can be used to make artefacts (e.g. orthographic drawing);			
M.D.3.3 make use of modelling techniques to model artefacts made in wood, metal and plastics (using basic modelling materials such as straws, foam, card, polymorph);			
M.D.3.4 use computer solid modelling techniques i.e. extrusion and revolving, to develop and test design ideas;			
M.D.3.5 create simple assemblies of computer generated solid models to confirm the accurate interaction of separate components;			
M.D.3.6 create 3D computer rendered images which clearly show the desired surface qualities (e.g. colour, texture of design ideas);			

M.D.3.7 generate working drawings using CAD, (e.g. cutting lists, dimensioning and appropriate BS conventions);			
M.D.3.8 access design data, using IT relating to for example the properties of materials, standard sizes, fixings, adhesives and components;			
M.D.3.9 create spreadsheets related to the costings of materials;			
M.D.3.10 investigate and disassemble and evaluate a range of manufactured products made from wood, metal and plastics, identifying the processes involved in their production;			
M.D.3.11 analyse and investigate the manufactured technologies used to make a range of artefacts (e.g. injection moulding, sand casting);			
M.D.3.12 analyse and investigate the visual and other sensory qualities in materials when analysing artefacts (e.g. colour, texture, smell);			
M.D.3.13 show awareness of different cultures and recognise the influences on the development of products (e.g. design movements, lifestyles, consumer values);			
M.D.3.14 recognise that there is an environmental consequence when using resistant materials;			
M.D.3.15 consider the impact on society of a range of products;			
M.D.3.16 consider how the physiological aspects of ergonomics can influence the design of products (e.g. anthropometrics, dynamic movement).			
M.M.3.1 use the properties and working characteristics of wood, metal plastics to meet design requirements (including modern materials such as polymorph, anodised aluminium);			
M.M.3.2 accurately mark out, using appropriate hand tools and take account of critical dimensions and tolerances when using wood, metal and thermoplastics (e.g. engineers squares, marking gauges, centre punch, odd leg callipers);			
M.M.3.3 accurately cut and waste, by hand and basic machines (e.g. pillar drill and band saw), wood, metal, and plastics to efficiently achieve appropriate fit and finish;			
M.M.3.4 accurately deform, form, and fabricate by hand and using basic machines (such as line bender, vacuum former, punch tools and jigs), wood, metal and thermoplastics;			

M.M.3.5 effectively join wood, metal and thermoplastic using appropriate hand techniques and basic fixing methods (e.g. wood joints, knock down fittings, soldering, brazing, adhesives etc);			
M.M.3.6 make use of CAM prototyping techniques to synthesise and develop design ideas (e.g. rapid prototyping, stereo lithography, laminate assemblies);			
M.M.3.7 consider visual and other sensory qualities of materials to meet design requirements (e.g. colour, texture, smell).			
M.K.3.1 consider and analyse the physical and working properties, at a micro level, of common woods, metals and plastics (e.g. tensile strength, ductility, malleability, ease of moulding and how this is related to the micro arrangement of particles and fibres in the material);			
M.K.3.2 understand the classification of wood, metal and plastics, according to their micro-structure (e.g. thermoplastics and thermosets);			
M.K.3.3 understand how the structure of wood, metal and plastics, at a macro level, influence use and effectiveness (e.g. cellulose layering, metal particle layers and arrangements of polymer chains);			
M.K.3.4 understand and recognise the importance of structural configuration when using wood, metal, plastics (e.g. space frame, monocoque, cantilever);			
M.K.3.5 understand how wood, metal and plastics resists forces, such as compression, tension, torque and bending;			
M.K.3.6 understand how a wide range of standardised components influence manufactured products.			

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