PRIFYSGOL glyndŵr UNIVERSITY

MODULE SPECIFICATION FORM

Module Title:	**Computer-Aided Design and Draughting**	Level:	**4**	Credit Value:	**10**

Module code: (if known)	**ENG466**	Cost Centre:	**GAME**	JACS2 code:	**H130**

Semester(s) in which to be offered:	**1**	With effect from:	**July 2015**

Office use only: To be completed by AQSU:	Date approved: July 2015 Date revised: Version No: 1

Existing/New:	**Existing**	Title of module being replaced (if any):	N/A

Originating Academic area:	**Engineering and Applied Physics**	Module Leader:	**N. Vidmer**

Module duration (total hours)	100	Status: core/option/elective (identify programme where appropriate):	**Free-standing 10-credit component comprising first half of ENG462 (Intro to Eng Design and Practice).**
Scheduled learning and teaching hours	36		
Independent study hours	64		
Placement hours	0		

Percentage taught by Subjects other than originating Subject (please name other Subjects):	**0%**

Programme(s) in which to be offered: **Enginering European Programme** (Non Award Bearing)	Pre-requisites per programme (between levels):	**None**

Module Aims:

1. To provide a practical insight into, and experience of, the engineering design process and to relate this to a range of engineering activities including engineering design and the use of design software within that process.
2. To contextualise these activities within the professional standards of the engineering profession and hence to evaluate and report on the process undertaken.

Expected Learning Outcomes

Knowledge and Understanding:
At the completion of this module, the student should be able to:

1. Relate and apply professional engineering standards to product design; *(KS 7)*
2. Use computer-based design software; *(KS 4)*
3. Select materials and components and hence realise a product design using practical skills;
4. Report on the exercise as a complete activity. *(KS 1)*

Key skills for employability

1. Written, oral and media communication skills,
2. Leadership, team working and networking skills
3. Opportunity, creativity and problem solving skills
4. Information technology skills and digital literacy
5. Information management skills
6. Research skills
7. Intercultural and sustainability skills
8. Career management skills
9. Learning to learn (managing personal and professional development, self management)
10. Numeracy

Assessment:

Please indicate the type(s) of assessment (eg examination, oral, coursework, project) and the weighting of each (%). ***Details of indicative assessment should also be included****.*

Assessment is 100% in-course. The assessment is is by means of a series of practical design exercises presented as a single portfolio to cover all outcomes. (This can be treated as compatible with Assessment 1 of the 20 credit module ENG462.)

The exercises emphasise software-handling techniques and range from placing straight lines onto a drawing to the creation and manipulation of 3-D images.

Assessment number (use as appropriate)	Learning Outcomes to be met	Type of assessment	Weighting	Duration (if exam)	Word count (if coursework)
Assessment One:	1, 2, 3, 4	Practical	100%		1,500

Learning and Teaching Strategies:

The major learning strategy will be practical-based learning initially using traditional drawing office methods then, for the greater part, in the CAD laboratory. Occasional lectures and demonstarations will be used to disseminate design theory and to demonstrate more complex software used in the design process.

Learning will be mainly by means of formative assignments and will be mostly practical work. Some research using current journals, textbooks and the internet will be carried out.

Syllabus outline:

Design process: Stages in design; stages in development; apply to software and to hardware product, maintaining a log report of activities.
(Specification, task analysis, outline design, selection of components/materials, detailed design including test definition or evaluation parameters, implementation, testing, evaluation of tests, reiteration as necessary, conclusions, reporting). Refer to quality (quality is designed in, not built in).

Design Tools:

Either Mechanical Specialisms:

Drawing standards: Orthographic first and third angle projection, sectional views, title blocks, dimensioning, construction lines, scaling, machining symbols, tolerances and allowances, auxiliary views, assembly drawings, symbols, British Standards, Codes of Practice.

Computer Aided Design: System management, 2D design, limits, creating and editing drawings, blocks, layers, dimensioning; 3D design, rendering, plotting, introduction to solid modelling. Introduction to modelling software (ProEngineer or similar).

Or Electrical and Electronic Specialisms:

Role of computer based tools within the process of developing an electrical or electronic product.

ECAD System Software: Types and levels of software systems. Features of computer aided design software. Uses of database software.

Range of Computer Design and modelling Tools: familiarity with packages for: electrical and electronic draughting; digital and analogue component and circuit modelling; circuit analysis; mathematical modelling; pcb layout design including routing and placement.

Personal skills: Self-evaluation (reflective log); target-setting and managing time; listening, speaking, non-verbal communication; note-taking; log report; formal report of complete exercise; presentation. (Reinforcement of health, safety, sustainability, ethical, economic and social considerations during the design/production process.)

Bibliography

Essential reading:

Cross, N. (2008) *Engineering Design Methods: Strategies for Product Design*, 4th Edn., Wiley-Blackwell.
Ashby, M.F. (2010) *Materials Selection in Mechanical Design*, 4th Edn., Butterworth-Heinemann.
Jiles, D. (2001) *Introduction to the Electronic Properties of Materials*, 2nd Edn., CRC Press.

Recommended reading:

Higgins, R. & Bolton, W. (2010) *Materials for Engineering and Technicians,* 5th Edn., Newnes.
Shackelford, J.F. (2008) *Introduction to Materials Science for Engineers*, 7th Edn., Prentice-Hall.
Giudice, F. et al. (2006) *Product Design for the Environment: A Life Cycle Approach*, CRC Press.
Bolton, W. (2001) *Electrical Electronic Measurement & Testing*, Butterworth-Heinemann.
Irene, E. (2008) *Electronic Materials Science: Surfaces, Interfaces, and Thin Films for Microelectronics*, Wiley-Blackwell.
Ulrich, R.K. & Schaper, L.W. (2003*) Integrated Passive Component Technology*, Wiley-Blackwell.