**Short Form Module Details**

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| **Module Title** | Design and Practice |
| **Level** | Level 4 |
| **Reference No.**  ***(showing level)*** | EUC\_4\_005 |
| **Credit Value** | 30 |
| **Student Study Hours** | Total learning hours: 300 hours  Contact hours up to 100 hours  Student managed learning hours: 200 hours or more |
| **Pre-requisite learning** | None |
| **Co-requisites** | None |
| **Excluded combinations** | None |
| **Module co-ordinator** | To be advised |
| **Faculty/Department** | Engineering, Science and the Built Environment |
| **Short Description** | The module is for all undergraduate year one engineering students, it covers practical work, design activities, sustainable development principles, project management, health and safety and risk management, and transferable skills. |
| **Aims** | The overall aim of the module is for students to begin their engagement with engineering design and to undertake practical engineering work.  **Part A (120-150 hours of student learning depending on discipline)**  **Practical work**  To provide skills designing and undertaking investigatory practical work in the students’ discipline  **Part B (120-150 hours of student learning depending on discipline)**  **Design and drawing**  To provide skills in design and drawing  **Part C (30 hours of student learning)**  **Transferable skills**  To provide skills in communication, management and health and safety and sustainable design methodologies |
| **Learning Outcomes** | **Knowledge and Understanding**:  To know and understand practical engineering skills and design processes  To know and understand the principles of sustainable development  To know and understand the legal, precautionary and management systems requirements needed for industrial safety  **Intellectual Skills**:  To be able to think critically in the context of problems and arguments in the discipline  To be able to handle open ended problems and turn those into questions that a design proposal can answer in area relevant to discipline  To be able to prosecute a conceptual design through to the stage of provision of adequate calculations and drawings, or prototypes as relevant to the discipline  **Practical Skills**:  To know and understand practical safety-related legal obligations in laboratory, workshop, field trip, fire drill and other university activities  To be able to undertake investigatory practical work in subject areas relevant to discipline  To be able to analyse results derived from real world data, including the estimation of errors and confidence limits  **Transferable Skills**:  To be able to research information using appropriate academic and technical abstracting engines and databases  To be able to write technical English, using appropriate computer based tools  To be able to prepare accurate and efficient calculations using spreadsheets  To be able to communicate ideas through visual means including by hand and computer aided drawing |
| **Employability** | Employers require skills in critical thinking and technical written English, as well as skills in design and the ability to observe and obtain data from the real world. The ability to design in the context of sustainable development principles and deliver through appropriate project management are also important. This module provides skills in these areas. |
| **Teaching and learning pattern** | The anticipated teaching and learning will be achieved through the following number of hours of activity:  Part A Workshops and practical sessions: 40-50  Part B Design studios and drawing: 40-50  Part C Transferable skills classes and tutorials: 10  **Total Contact hours: 100**  Part A Work linked to practical sessions: 80-100  Part B Worked linked to design and drawing: 80-100  Part C Work linked to transferable skills: 20  **Student managed learning hours: 200**  **Total learning time: 300** |
| **Indicative content** | **Generic Specification of content**  **Part A (120-150 hours of student learning)**  **Practical work**  **Undertaking practical work**. Including designing appropriate practical experimentation, undertaking investigatory work, deriving results from such work, appropriately analysing them, discussing the results and then drawing conclusions.  **Prototyping and model building**. Including either the development of manufacturing or other types of prototype or engineering models relevant to the students’ discipline.  **Health and Safety**. Safety induction for students. Health and Safety at Work Act. COSHH regulations. Railway safety. HSE. Prohibition and enforcement notices. Powers of Inspectors. Records. CITB certificate. Causes of accidents. Statistics. Hazard identification and risk management. Accident prevention. PPE. Implications for CDM Regulations. Criminal penalties. Site safety management  **Project management and group work**. Including group role descriptions and introduction to functions of leaders and managers and basic project management, including and understanding of project information and specifications and deliverables  **Part B (120-150 hours of student learning)**  **Design methods and constraints**. Including the processes of briefing, specification, sourcing and evaluating technical literature, materials selection, defining input parameters, form options choosing and sustainable development principles. Also including ways of evaluating design outputs.  **Creative thinking and problem solving techniques.** Including introduction to techniques including brainstorming, mind-mapping and mental block busting. Also including processes of conceptual design, synthesis and an appreciation of aesthetics.  **Hand drawing**. Including material selection, approaches to sizing and proportion and techniques. Subject matter will vary depending on students’ discipline and may include fieldwork sketching buildings or large scale engineering artefacts, or studio based work for smaller products).  **Computer Aided Drawing**. Using packages and conventions appropriate to the students’ discipline.  **Part C (30 hours of student learning)**  **Presentations**. Including guidance through software capabilities and require students to prepare and deliver a computer based presentation including use of appropriate combinations of words, tables and images to convey real meaning.  **Technical written English**. Including accurate spelling, and correct and appropriate structure at sentence, paragraph and document level, and which displays an ability to communicate succinctly and use punctuation appropriately, and which has been prepared taking advantage of features in word processing packages.  **Referencing**. Information and literature search leading to including both the means of including material from other sources in the text, and the means of generating the list of bibliographic details, including use of proprietary software as appropriate to the discipline. Understanding of plagiarism.  **Personal Development Planning**, including the processes of reflective practice, SWOT analysis, evaluation of prior experience and personal goal setting for the future, including progression through the professional body  **Elements of practical work will include:**  Materials laboratories  Applied mechanics  Thermofluids laboratories  Flow rates laboratories  Electric circuits laboratories  Electronics workshops  Electrical workshops  **Elements of design work will include:**  Design case studies  Specification and materials selection  Design methodology for construction, manufacture and assembly  Conceptual and detailed design  Construction project management techniques and software tools |
| **Assessment**  ***Elements & weightings*** | **Part A**  A series of practical assignments specific to the discipline 45%  **Part A sub-total (120-150 hours learning time) 45%**  **Part B**  A series of design projects involving designing and making, project planning, drawing, budgeting, and testing 45%  **Part B sub-total (120-150 hours learning time) 45%**  **Part C**  Portfolio of assignments based on development of written English skills: 10%  **Part C sub-total (30 hours) 10%**  **Total: 100%** |
| **Indicative Sources**  ***(Reading lists)*** | **Core**  London South Bank University Core Skills Unit, Study Skills Survival Guide, LSBU 2002  Matthews, C., *Case Studies in Engineering Design*, Arnold, 1998.  Morton R, Construction UK: Introduction to the Industry, Blackwell, London 2002  **Background**  Applegarth, M., and Posner, K. *The Project Management Pocketbook*, Management Pocketbooks, 1998.  Beer D, McMurray D, A Guide to Writing as an Engineer, Wiley, London 2004  Finney and Fowler, Foundation Course (CDT) Collins 1986  Hawkes B, Succeeding with Autocad, McGraw-Hill, London, 1995  London South Bank University, CAD skills. LSBU 2000  Northedge A, The Good Study Guide, Open University 1990  Wright, I., *Design Methods in Engineering and Product Design*, McGraw-Hill, 1998.  Young, T., *The Handbook of Project Management*, Kogan Page, 1998.  **Optional**  Norman, D.A. (1998) *The Design of Everyday things*, The MIT Press, London, 1998, ISBN 0-262-64037-6  Timings, R.L. (1993) *Manufacturing Technology*, Volume 1, Second  Edition, Longman Scientific & Technical ISBN 0-582-09194-2  Timing, R.L. and Wilkinson, S.P. (2000) *Manufacturing Technology*, Volume 2, Second Edition, Longman, 2000, ISBN 0-582-357977  Matthews, C. (1998) *Case Studies in Engineering Design*, Arnold, 1998, ISBN 0470 32363-9  Kalpakjian, S. and Schmid, S.R., *Manufacturing Engineering and Technology*, 4th Edition, Prentice Hall, 2001, ISBN 0-201-36131-0  Poli, C. (2001) *Design for Manufacturing – A Structured Approach*, Butterworth-Heinemann, 2001, ISBN 0-7506-7341-9 |