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| <b>Module Title</b><br>Creative Design  | <b>Module Code</b><br>MSDE 225                        | <b>Semester (Sem 1 / Sem 2)</b><br>Sem 1                            |
| <b>Credits</b><br>10  | <b>Level</b><br>4                                     | <b>Professor and email</b><br>Nak-Kyun Cho<br>nkcho@seoultech.ac.kr |
| <b>Delivery Method</b><br>Lecture / Project   | <b>Delivery Location</b><br>SeoulTech,<br>Mugung Hall |   |
| <p><b>Pre-requisite</b><br/>Pass English Language test (writing and Speaking/listening) at level 3 with a minimum of 40% (Grade D), Statics</p> <p><b>Co-requisite</b><br/>Mechanics of Material, Engineering Math, Computer Aided Design (CAD)</p>   |   |   |
| <p><b>Module Synopsis</b><br/>This course is intended to familiarize engineering students with the nature of design and how it is done as the first introductory course of engineering design. A definition of design, difference between analysis and open ended design, nine step model of design, process of design-fabrication-evaluation, way of creative design and design project are included in the course. Assessment is through tests, a term project, and assignments.</p> <p><i>Prerequisite course: Mechanics of Material (or Solid Mechanics), Computer Aided Design (CAD). If foreign exchange students did not take all prerequisite, the module leader may reject an application to enrolling in this module.</i></p>   |   |   |
| <p><b>Outline Syllabus</b></p> <p><b>What is the Engineering Design?</b><br/>Introduce the basic concept of engineering design and nature of design</p> <p><b>Systematic Design Process</b><br/><b>Classic Design Approach/manufacture model</b><br/>Descriptive models, conceptual design, prescriptive models, integrated models</p> <p><b>Product Design Specification , Concept Design Specification and Product Specification relationships to the design process</b><br/><b>Introduction to Sustainability in Engineering Design and the role of the Designer</b> Realization of design using proto-typing and using 3D CAD simulations</p> <p><b>Creativity of Design</b><br/>Solution Generation techniques such as Brainstorming, Heuristic redefinition, etc.</p> <p><b>Concept Design</b><br/>Overall procedure for concept design selection and presentation of the concept.<br/>Explanation of the Detail Design process</p> |   |   |



Design for a Market. Introduction to Understanding markets and where the product might be sold and related manufacturing, wholesale and retail costings

**Design Case study on an engineering assembly such as a gearbox. Explain design methodology, analysis overview, design elements (bearings/seals) how presented for manufacture**

### Indicative Reading

- 1) Fundamentals of Engineering Design, Barry Hyman, Prentice Hall, 2004
- 2) Engineering Design Methods Strategies for Product Design, Nigel Cross, Wiley, 2008
- 3) Sustainability in Engineering Design: Johnson and Gibson: 2014

| NOTIONAL STUDENT WORKLOAD (Hours)  | Hours |
|--|-------|
| MODE OF DELIVERY (FT / PT / DL)  | FT    |
| Lectures   | 30    |
| Seminars   |       |
| Tutorials  | 15    |
| Laboratories/studios/practical   | 10    |
| Directed learning  | 20    |
| Independent Learning   | 20    |
| Work experience/fieldwork  |       |
| Other: eg formal presentation  | 5     |
| Total Workload<br>100 hours for a 10 credit module<br>200 hours for a 20 credit module | 100   |

### Module Learning Outcomes

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| KU1,2,3 | Demonstrate basic knowledge of the scientific and mathematical foundations of engineering to solve basic problems.<br>Perform simple analysis of familiar engineering systems. |
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## MSDE Module Descriptor

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|          | Identify and utilise basic methodologies to create solutions to specific engineering problems.   |
| IPSA 1,5 | Demonstrate the use of fundamental approaches to solving readily defined engineering problems.<br>Demonstrate the ability to solve open ended design problems and communicate the designs to a third party |
| PVA 2,3  | Demonstrate creativity in discussing solutions to standard problems.<br>Able to evaluate how sustainable engineering techniques may be applied to engineering systems and products                         |
|          |  |

| Assessments  | Assessment Type               | Weighting % | Mid-Term/interim/final |
|--------------|-------------------------------|-------------|------------------------|
| Coursework   | Poster                        | 20%         | Mid term               |
| Project      | Final Report/<br>Presentation | 80          | Final                  |
| Quiz         |                               |             |                        |
| Test         |                               |             |                        |
| Laboratory   |                               |             |                        |
| Exam         |                               |             |                        |
| Presentation |                               |             |                        |