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| Module Title Capstone Design I | Module Code MSDE 322 | Semester (Sem 1 / Sem 2) Sem 2 |
| Credits 10 | Level 5 | Professor and email Dong-Young JANG dyjang@seoultech.ac.kr |
| Delivery Method Seminar, tutorial, workshops / Project | Delivery Location SeoulTech, Mugung Hall | |

Module Synopsis

Today's industry requires engineering students to have interdisciplinary experience with the system-oriented and open-ended design that requires creativity, application of engineering science and analysis, and consideration of realistic constraints and social factors. Hence, students will be required to gather, investigate, evaluate and assess information to successfully achieve a technological solution to an engineering problem, including realistic constraints such as safety, economic factors, reliability, aesthetics, ethical considerations and societal impact. Reports, presentations, and final report through the semester are considered for the assessment.

Outline Syllabus

Capstone design step 1

Learning design process of capstone design I. How to organize design teams and design topics.

Each student submits a proposal for an investigation he/she would like to undertake. Where appropriate this may be a continuation of work undertaken during supervised work experience or suggested by the employer. On approval an appropriate supervisor is allocated. The supervisor may offer suggestions but the responsibility for determining the direction of the work and the progress lies with the student.

Review of Writing Good Report / Excellent Presentation.

This module aims to expose students to system design and integration, teach to work hand-in-hand with industrial sponsors on a real-life project, and to integrate manufacturing and design.

Indicative Reading:

- 1) Shigley's Mechanical Engineering Design, Richard G. Budynas and J. Keith Nisbett, 8th Edition, 2008
- 2) *Product Design and Development* by Karl T. Ulrich and Steven D. Eppinger (McGraw-Hill 2008)
- 3) Control Systems Engineering 4th Edition, Norman S. Nise, Wiley, 2003

Pre-requisite(s):



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| <ol style="list-style-type: none"> 1) MSDE 240 Electronic Circuits, 2) MSDE 220 CAD I, 3) MSDE 323 Design of Machine Element, 4) MSDE 231 Introduction to Manufacturing, 5) MSDE 324 Intermediate Engineering Design |
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| NOTIONAL STUDENT WORKLOAD | Hours |
|--|---|
| MODE OF DELIVERY (FT / PT / DL) | FT |
| Lectures | |
| Seminars | 10 |
| Tutorials | 10 |
| Laboratories/studios/practical | 20 |
| Directed learning | 10 |
| Independent Learning | 40 |
| Work experience/fieldwork | 5: Learn through work in the outside for production |
| Other: eg formal presentation | 5 |
| Total Workload 100 hours for a 10 credit module 200 hours for a 20 credit module | 100 |

| Module Outcomes | |
|-----------------|---|
| KU1,3,4,5 | <p>KU1. Apply advanced knowledge of the scientific and mathematical foundations of engineering to solve problems.</p> <p>KU3. Identify and utilise advanced methodologies to create solutions to a variety of engineering problems.</p> <p>KU4. Define and investigate unfamiliar problems and constraints that occur in engineering design with the aid of appropriate tools.</p> <p>KU5. Understand how Design and apply to advanced manufacturing methods and systems combine to create new products</p> |
| IPSA2,5 | <p>IPSA2. Communicate a range of engineering concepts to expert and non-expert audiences using a variety of formats and media.</p> <p>IPSA5. Demonstrate the ability to solve advanced design problems and communicate the designs to a third party</p> |
| PVA1,2,3 | <p>PVA1. Produce a range of solutions to benefit society by applying sound engineering practise with an awareness of ethical considerations.</p> |



MSDE Module Descriptor

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| | PVA2. Apply creativity in the development of solutions to standard engineering problems. PVA3. Include sustainable engineering techniques when applied to engineering systems and products |
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| Assessments | Assessment Type | Weighting % | Midterm/interim/final |
|--------------------|-------------------------------|--------------------|------------------------------|
| Course Work | Weekly Reports | 10 | |
| Course Work | Final Report/ Presentation | 50 | Final |
| Quiz | | | |
| Test | | | |
| Laboratory | | | |
| Exam | | | |
| Presentation | 3 progress presentations | 40 | |