



Module Title	Module Code	Semester (Sem 1 / Sem 2)
Capstone Design I	MSDE 322	Sem 2
Credits	Level	Professor and email
10	5	Dong-Young Jang <a href="mailto:dyoung@seoultech.ac.kr">dyoung@seoultech.ac.kr</a> Dongha SHIM <a href="mailto:dongha@seoultech.ac.kr">dongha@seoultech.ac.kr</a>
Delivery Method	Delivery Location	
Seminar, tutorial, workshops / Project	SeoulTech, Mugung Hall	
<p><b>Module Synopsis</b></p> <p>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. Each design group has to complete the design documents as well as BOM for manufacturing in the following semester.</p> <p>Each member of a design group has to specify his job description and define his/her individual contribution to the group project during the Capstone II module in the 1<sup>st</sup> Semester of Year 4</p> <p>This module is the contribution to a three part design process            Capstone Design I specifies the group project and allocates individual component projects            Capstone Design II is performed by individuals on a particular part of the overall project            Capstone Design III consolidates all the individual projects from Capstone Design II and combines them into a complete and complex Device</p>		
<p><b>Outline Syllabus</b></p> <p><b>Capstone design step 1</b>            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.</p> <p><b>Review of Writing Good Report / Excellent Presentation.</b></p> <p>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.</p>		



### 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 4<sup>th</sup> Edition, Norman S. Nise, Wiley, 2003

### Pre-requisite(s):

- 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

NOTIONAL STUDENT WORKLOAD (Hours)	Hours
MODE OF DELIVERY (FT / PT / DL)	FT
Lectures	
Seminars	20
Tutorials	20
Laboratories/studios/practical	40
Directed learning	20
Independent Learning	80
Work experience/fieldwork	10: Learn through work in the outside for production
Other: eg formal presentation	10
Total Workload 100 hours for a 10 credit module 200 hours for a 20 credit module	200

### Module Outcomes

KU1,3,4,5	Apply advanced knowledge of the scientific and mathematical foundations of engineering to solve problems. Identify and utilise advanced methodologies to create solutions to a variety of engineering problems. Define and investigate unfamiliar problems and constraints that occur in engineering design with the aid of appropriate tools. Understand how Design and apply to advanced manufacturing methods and systems combine to create new products
IPSA 2,5	Communicate a range of engineering concepts to expert and non-expert audiences using a variety of formats and media. Demonstrate the ability to solve advanced design problems and communicate the designs to a third party



## MSDE Module Descriptor

PVA 1, 2,3	<p>Produce a range of solutions to benefit society by applying sound engineering practise with an awareness of ethical considerations.</p> <p>Apply creativity in the development of solutions to standard engineering problems.</p> <p>Include sustainable engineering techniques when applied to engineering systems and products</p>

Assessments	Assessment Type	Weighting %	Mid-Term/interim/final
Course Work	Weekly Reports	20	
Course Work	Final Report/ Presentation	50	Final
Quiz			
Test			
Laboratory			
Exam			
Presentation	3 progress presentations	30	