HANYANG UNIVERSITY

Hanyang International Summer School

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Course Information	**Class No.**	TBA	**Course Code**	DME1003	**Credits**	3
	Course Name	Introduction to Smart Manufacturing				
	Lecture Schedule	Tue-Fri / 9:00 AM - 12:00 PM				
	Course Description	● This class will discuss about an introduction to the 4th industrial generation and smart manufacturing. ● The main objective of learning this class is to study an importance of knowledge-fusion and basic concepts of IoT, cloud, big data, AI, virtual environments, and machine tools for smart manufacturing. ● Students can improve their understanding and knowledges for smart manufacturing by connecting team-based experience. The governments of major countries in the world are responding quickly to the 4th Industrial Revolution, and they are trying to take the leading role in a new era through differentiated policy supports. The society is also supporting the innovation of manufacturing industry through 'Smart Manufacturing Innovation Vision 2025'. According to this trend, this course teaches basic concepts for Artificial Intelligence(AI), Internet of Things(IoT), 3D printing, and Cyber-Physical System(CPS) which are core technologies for the smart manufacturing. In addition, this course help students understand the manufacturing innovation through a practical training. Through these activities, this course enables self-directed learning as an active mechanical engineer.				
	Course Objective	1. This course provides insights about a future society according to the 4th Industrial Revolution and knowledges for convergence technologies related with mechanical engineering to first-year undergraduate students. 2. This course helps students understand smart manufacturing. 3. This course improves the collaboration and communication skills of the students by debating practical issues and performing practice through team activities. 4. This course consists of a lecture and practice per class. 5. This course provides the contents of basic concepts, core				

<table>
<tr><td rowspan="3"></td><td colspan="2"></td><td colspan="3">technologies and industrial fields for easy understanding of smart manufacturing.
6. At the end of the semester, there will be evaluations of term projects.</td></tr>
<tr><td colspan="2">Prerequisite</td><td colspan="3">-</td></tr>
<tr><td colspan="2">Materials/Textbooks</td><td colspan="3">Linear algebra and its applications (4th edition), Gilbert Strang</td></tr>
<tr><td rowspan="7">Evaluation</td><td colspan="2">Attendance</td><td>10%</td><td>Quiz</td><td>%</td></tr>
<tr><td colspan="2">Assignment</td><td>10%</td><td>Mid-term Exam</td><td>30%</td></tr>
<tr><td colspan="2">Presentation</td><td>%</td><td>Final Exam</td><td>30%</td></tr>
<tr><td colspan="2">Group Project</td><td>20%</td><td>Participation</td><td>%</td></tr>
<tr><td colspan="2" rowspan="3">Etc.</td><td colspan="2">Evaluation Item</td><td>Ratio</td></tr>
<tr><td colspan="2"></td><td>%</td></tr>
<tr><td colspan="2"></td><td>%</td></tr>
<tr><td rowspan="17">Daily Lecture Plan</td><td rowspan="4">Week 1</td><td>Day 1</td><td colspan="3">Importance of Manufacturing Technology</td></tr>
<tr><td>Day 2</td><td colspan="3">Categories of Manufacturing
Lecture 2 discussion & Matlab setup</td></tr>
<tr><td>Day 3</td><td colspan="3">Conventional Manufacturing Technology – 1. Casting
Lecture 3 discussion & Python setup</td></tr>
<tr><td>Day 4</td><td colspan="3">Conventional Manufacturing Technology – 2. Bulk Deformation (1/2)
Training1: Tensile Test</td></tr>
<tr><td rowspan="4">Week 2</td><td>Day 1</td><td colspan="3">Conventional Manufacturing Technology – 3. Bulk Deformation (2/2)
Training2: Compression Molding</td></tr>
<tr><td>Day 2</td><td colspan="3">Conventional Manufacturing Technology – 4. Turning & Milling
Training3: Turning</td></tr>
<tr><td>Day 3</td><td colspan="3">Mid-term exam</td></tr>
<tr><td>Day 4</td><td colspan="3">Fourth Industrial Revolution – 1. 3D printing (1/2)
Training4: Milling</td></tr>
<tr><td rowspan="4">Week 3</td><td>Day 1</td><td colspan="3">Fourth Industrial Revolution – 2. 3D printing (2/2)
Training5: 3D Printing</td></tr>
<tr><td>Day 2</td><td colspan="3">Fourth Industrial Revolution – 3. AI
Training6: AI training (Teachable Machine)</td></tr>
<tr><td>Day 3</td><td colspan="3">Fourth Industrial Revolution – 4. Machine Learning
Training7: MATLAB training</td></tr>
<tr><td>Day 4</td><td colspan="3">Fourth Industrial Revolution – 5. CPS
Instruction for Final Exam & Project</td></tr>
<tr><td rowspan="4">Week 4</td><td>Day 1</td><td colspan="3">Fourth Industrial Revolution – 6. Digital Twin
Discussion on Project Idea</td></tr>
<tr><td>Day 2</td><td colspan="3">Final Exam</td></tr>
<tr><td>Day 3</td><td colspan="3">Submission of Project</td></tr>
<tr><td>Day 4</td><td colspan="3">Graduation (NO class)</td></tr>
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