Seoul National University of
Science & Technology
232 Gongneung-ro,Nowon-gu,
Seoul 01811 Korea

MSDE Module Descriptor

Module Title Non-traditional Manufacturing Laboratory	**Module Code** MSDE 432	**Semester (Sem 1 / Sem 2)** Sem 2
Credits 20	**Level** 6	**Professor and email** Dong-Young JANG dyjang@seoultech.ac.kr
Delivery Method Tutorial, Laboratory	**Delivery Location** SeoulTech, Mugung Hall	

Module Synopsis

Manufacturing processes, making use of electrical, chemical, ultrasonic, magnetic, and photonic sources of energy, are referred to as nontraditional manufacturing technologies. These energy field-assisted processes allow innovative approaches to material processing and improve the productivity and overall quality of the finished product. These manufacturing processes are also applied to fabricate microchip in the semiconductor industries. The course introduces nontraditional manufacturing technologies including microelectronic fabrication process, explains how products are made, and describes how manufacturing problems are solved. Through various laboratory works, students will easily have chance to practice technologies.

Outline Syllabus

1. Introduction to Non Traditional Manufacturing Processes
2. Laboratories on Microelectronic Fabrication Process
3. Laboratories on Mechanical Processes (Ultrasonic machining, Water jet machining, Magnetic abrasive machining)
4. Laboratories on Electrochemical Processes (Electrochemical machining, and Electro etching) and Thermal Processes (Electro-discharge machining, electron beam, and ion beam machining (FIB))
5. Laboratories using 3D Printer

Indicative Reading:

1. Mikell P. Groover, Fundamentals of Modern Manufacturing (5th Edition)
2. published by John Wiley & Sons, Inc., 2013
3. ISBN 978-1-118-47420-4
4. Serope Kalpakjian and Steven Schmid, Manufacturing Processes for Engineering Materials(5th Edition) published by Pearson Education, Inc., 2008, ISBN 0-13-601959-5
5. Journals including ASME Journal of Manufacturing Science and Engineering, Annals of the CIRP, Precision Engineering, etc.
6. Reading Materials recommended by Instructor

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NOTIONAL STUDENT WORKLOAD	Hours
MODE OF DELIVERY (FT / PT / DL)	FT
Lectures	10
Seminars	10
Tutorials	
Laboratories/studios/practical	50
Directed learning	
Independent Learning	30
Work experience/fieldwork	
Other: eg formal presentation	
Total Workload 100 hours for a 10 credit module 200 hours for a 20 credit module	100

Module Outcomes	
KU1,3,4	KU1. Evaluate and apply complex knowledge of the scientific and mathematical principles of engineering to solve Real-World problems. KU3. Introduce and utilise complex methodologies to create solutions to a variety of Real-World engineering problems. KU4. Define and investigate complex problems and constraints that occur in engineering design with the aid of advanced tools.
IPSA3,4	IPSA3. Derive solutions to complex health and safety, sustainability and environmental issues in the engineering sector. IPSA4. Ability to create innovative, sustainable critically evaluated solutions to complex engineering problems.
PVA2	PAV2. Critically analyse advanced solutions to complex engineering problems.

Assessments	Assessment Type	Weighting %	Midterm/interim/final
Course Work	Laboratory (continuous Assessment)	70	

Course Work	Final Report/ Presentation	30	Final
Quiz			
Test			
Laboratory			
Exam			
Presentation			