



*U.S. Manufacturing Competitiveness Initiative:  
Dialogue on Next Generation Supply Networks and Logistics*

# Full Spectrum Production: Educational Challenges

Leon F. McGinnis

Professor Emeritus, ISyE

Associate Director, MARC





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## MEP Curriculum

Course Group 1: Electrical & Computer Engineering (ECE)	Course Group 2: Industrial & Systems Engineering (ISyE)	Course Group 3: Mechanical Engineering (ME)
* ECE 4761: Industrial Controls and Manufacturing	ISyE 6201: Manufacturing Systems	** ME 4210: Manufacturing Processes and Engineering
ECE 6450: Introduction to Microelectronics Technology	ISyE 6202: Warehousing Systems	ME 6222: Manufacturing Processes and Systems
ECE 6460: Microelectromechanical Devices	ISyE 6203: Transportation and Supply Chain Systems	ME 6223: Automated Manufacturing Process Planning
ECE 6556: Intelligent Control	ISyE 6405: Statistical Methods for Manufacturing Design/Improvement	ME 6224: Machine Tool Analysis and Control
ECE 6557: Manufacturing Systems Design	ISyE 6413: Design and Analysis of Experiments	ME 6405: Introduction to Mechatronics
ECE 6759: Plasma Processing of Electronic Materials and Devices	ISyE 6414: Statistical Modeling and Regression Analysis	ME 6407: Robotics
	ISyE 6669: Deterministic Optimization	ME 7227: Rapid Prototyping in Engineering

Graduate Level Certificate  
Add-on to degree

Take 2 courses each from  
two groups (total 4)

Seminar participation

International internships  
Fellowships



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# (New?) Educational Realities

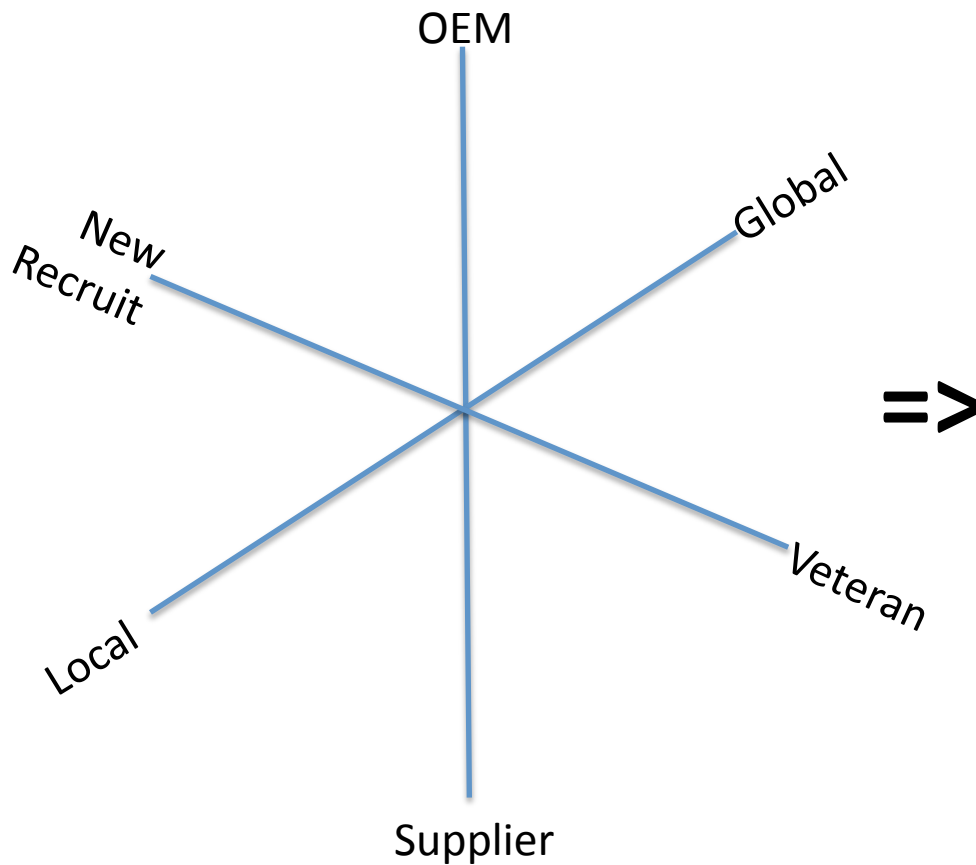
- Employment is not forever
    - Average employment tenure for wage and salary workers between 1996 and 2010 is less than 5 years
  - Engineering knowledge half-life is shrinking
    - Estimated in 1998 to be in range of 2.5 to 7.5 years (Wulf, The Bridge)
  - Education can't be a one time investment
- => *Maybe we need to re-evaluate what is “core or fundamental” and what is “contemporary”*





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# No “one size fits all” education



*Maybe we need a portfolio of education alternatives that are “customizable”*



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# Production is Changing

- Global brand => global production
- “Air isn’t free”
- Market distortions

*=> The production enterprise is a very complex machine, with many moving parts, in a complex environment*



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# Who Understands the Machine?

- Knowledge from decomposition leads to silos which inhibit synthesis
  - Modern global production is a socio-technical enterprise embedded in a socio-economic-political environment
- => *Contemporary education is not designed to address this challenge!*