



Intelligent Manufacturing Systems and Management

Offered in 114-2 | Updated

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Serial Number

45901



Course Number

IE5064



Course Identifier

546 U1230



No Class



3 Credits



Elective

GRADUATE INSTITUTE OF INDUSTRIAL ENGINEERING



KAO YU TING



Wed 2, 3, 4



博雅306



Type 2



20 Student Quota

NTU 20

 No Specialization Program

 English

 NTU COOL

 Core Capabilities and Curriculum Planning

 Notes

The course is conducted in English °

 NTU Enrollment Status

Enrolled	Remaining	Registered
10 / 20	10	0

 Course Description

This course aims to introduce the scientific foundations and managerial framework of manufacturing systems. It explores the fundamental behavior of production systems, the impact of variability on system performance, and topics including supply chain management, forecasting, inventory control, capacity planning, master production scheduling, material requirements planning (MRP), scheduling theory, Theory of Constraints (TOC), and production control. The course is structured at both the macro and micro levels: the macro level focuses on overall system architecture and resource allocation decisions, while the micro level emphasizes shop floor scheduling and operational control. In addition to theoretical concepts and modeling techniques, the course highlights practical industry case analyses, using real manufacturing and

supply chain scenarios to understand managerial issues and decision-making logic. Through case discussions, problem analysis, and team-based project presentations, students will investigate and demonstrate current hardware, software, system solutions, design concepts, and applications in production and operations management, thereby bridging theory and practice.

🕒 Course Objective

After completing this course, students are expected to achieve the following learning objectives:

- Understand the fundamental behavior of manufacturing systems: Develop a scientific perspective on manufacturing systems and understand the causal relationships and operational logic among capacity, inventory, flow time, and variability.
- Familiarize with production planning and control frameworks: Understand the role of production planning and control in enterprise operations and explain the interactions among supply chain management, forecasting, inventory policies, capacity planning, and master production scheduling.
- Master key production management methods and tools: Apply MRP, scheduling techniques, TOC/DBR, line balancing, and shop floor management methods to address production planning and dispatching problems.
- Analyze and improve manufacturing system performance: Identify bottlenecks and variability sources within production processes, evaluate their impact on efficiency, and propose improvement strategies.
- Understand trends and developments in modern manufacturing: Gain

knowledge of current applications and advances in smart manufacturing, digital factories, automation, and information systems (e.g., MES/APS).

- Apply theory to real-world cases: Connect theoretical concepts to real operational issues through industry case analysis and propose feasible improvement recommendations.

Course Requirement

Expected weekly study hours before and/or after class

Office Hour

By appointment. Please email me in advance to discuss and schedule a meeting time.

***This office hour requires an appointment**

Designated Reading

References

Grading

30%	Assignments
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30%	Midterm
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40%	Term Project
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1. NTU has not set an upper limit on the percentage of A+ grades.
2. NTU uses a letter grade system for assessment. The grade percentage ranges and the single-subject grade conversion table in the NATIONAL TAIWAN UNIVERSITY Regulations Governing Academic Grading are for reference only.

Instructors may adjust the percentage ranges according to the grade definitions.
For more information, see [the Assessment for Learning Section](#) °

🔗 Adjustment methods for students

Adjustment Method	Description
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D1	由師生雙方議定 Negotiated by both teachers and students
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B1	延長作業繳交期限 Extension of the deadline for submitting assignments
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A3	提供學生彈性出席課程方式 Provide students with flexible ways of attending courses
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🕒 Make-up Class Information

📅 Course Schedule

Week 0

Sponsor |  華南銀行
HUA NAN BANK

NTU Course

NTU | NTU ACA

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