

# Department of Industrial Engineering

## Master of Science in Management Science and Engineering (Global Manufacturing) <sup>1</sup>

(2016)

The duration of the program is normally two years, no more than 3 years.

### 1. Credit Requirements

The students are required to accomplish at least 26 credits, including 4 credits from public compulsory courses, 6 credits from compulsory activities and minimal 16 credits from major courses.

The students taking this program should configure their cultivation plan and submit the course selection to the Department office of Industrial Engineering (IE) within the first three weeks of the first semester of the first academic year.

#### 1.1 Public Compulsory courses (minimum 4 credits)

● Chinese Language I	60610162	2 credits	Autumn/Spring
<b>OR</b> Chinese Language II <sup>2</sup>	60610172	2 credits	Autumn/Spring
● Chinese Culture and Society <sup>3</sup>	60610082	2 credits	Autumn/Spring

#### 1.2 Compulsory Activities (minimum 6 credits)

● Research Seminar <sup>4</sup>	69990031	1 credit	
● Literature Review and Research Proposal	69990021	1 credit	
● Social Practice	70160591	1 credit	Autumn
● China Studies: Industry, Society and Culture <sup>5</sup>	80160433	3 credits	Spring

Besides, each graduate student is required to attend at least 10 academic seminars during their

---

<sup>1</sup> This cultivation plan is written both in English and Chinese. The English version is translated from the Chinese version, and the English version is only used for reference. The Chinese version provides the accurate information. The date of setting this version is on June, 2016;

<sup>2</sup> The student can apply for exemption of the course on condition that one of the corresponding requirements in the students' handbook is satisfied, refer to Page 93;

<sup>3</sup> This course can be replaced by the courses from the same group in the student's handbook, refer to Page 93;

<sup>4</sup> Research Seminar: the research seminar is composed of two parts: (1) each student should participate at least 10 times (inclusive) in seminars held in IE department or in Tsinghua University; (2) each student should participate at least twice in the doctoral forum of our department, including at least once to report his/her thesis progress (oral presentation);

<sup>5</sup> This course is mainly in the manner of lecture, investigation, report, and short paper, which runs through the whole process of the study.

two years' studies in Tsinghua

### 1.3 Major Courses (minimum 16 credits)

#### 1.3.1 Basic Major Courses (minimum 3 or 4 courses<sup>6</sup>)

• Quantitative Analysis	80160393	3 credits	Autumn
<b>OR</b> Advanced Statistics* <sup>7</sup>	80160232	2credits	Autumn
• Decision Making	70160513	3 credits	Autumn
<b>OR</b> Advanced Operations Research*	70160014	4 credits	Autumn
• Production Management	70160033	3 credits	Autumn
• Ergonomics	70160613	3 credits	Autumn
• Manufacturing in China	80160423	3 credits	Spring

#### 1.3.2 Applied Major Courses (minimum 2 credits)

• Logistics and Supply Chain Management	80160223	3 credits	Spring
• Quality Engineering	70160023	3 credits	Autumn
• Theory of Modern Inventory Management*	80160192	2 credits	Spring
• Data Analysis for Human Factors Research*	80160372	2 credits	Autumn

#### 1.3.3 Practical Major Courses (minimum 3 credits)

• Systematic Product Design and Development	80160283	3 credits	Autumn
• Engineering and Technology Management	80160363	3 credits	Spring

#### 1.3.4 Scope and Depth Expanding Courses (minimum 0 credits)

• Theory of Traffic Engineering and Management*	80160182	2 credits	Spring
• Distribution System Modeling*	80160152	2 credits	Spring
• Advanced Quality Management*	80160172	2 credits	Spring
• Enterprise Information and Integration*	80160033	3 credits	Spring
• Human Computer Interface Design*	80160132	2 credits	Spring

---

<sup>6</sup> According to the results of the entrance test with the 2 courses, Quantitative Analysis and Decision Making, the students will receive instructions on the course selection;

<sup>7</sup> The courses with \* are taught in Chinese.

● Contemporary Safety Engineering*	80160052	2 credits	Spring
● Work Organization*	80160022	2 credits	Spring
● Production Scheduling Theory and Algorithms*	80160062	2 credits	Spring
● Human Factors Measurement*	80160382	2 credits	Autumn
● Game Theory and Behavioral Decision Making*	90160122	2 credits	Autumn
● Stochastic Optimization*	90160112	2 credits	Spring

### 1.3.5 Academic and Professional Quality Courses (minimum 0 credits)

● Industrial Engineering Ethics*	60160021	1 credits	Autumn
----------------------------------	----------	-----------	--------

### 1.4 Course credits substitutions

If the students have sufficient background on the relevant major courses, they may apply for exemption of the courses if they could pass the teacher's evaluation, or select the major courses taught in Chinese instead of the major courses in this curriculum after obtaining the approval of the IE Department. The alternative courses also need to satisfy the credit requirements. If your bachelor degree is not on this major, you may need some supplementary course under the guidance of your supervisor or project director. The credits of the supplementary courses are not included in the credit requirements for the degree.

## 2. Degree Thesis Arrangement

**Purpose:** The purpose of the degree thesis is to enhance the students' comprehensive ability in using knowledge and innovation ability in scientific research.

**Topic selection:** The topic of the thesis includes but is not limited to academic research and practical applications<sup>8</sup>. Through obtaining the approval of the IE Department, the 4-6 month or even longer internship in an enterprise that has certain research or application value can also be the topic of the thesis<sup>9</sup>.

---

<sup>8</sup> We suggest choosing a practical application topic before considering other topics. One of the possible ways is to apply what you have learned in the course of theory and method, to systematically analyze a specific industry of China and to give certain feasible solution. For example, you can compare the industry of China with your country and analyze the existing opportunities and challenges, etc.

<sup>9</sup> Internship that meets the following conditions might be chosen to the topic of the thesis: (1) the enterprise allows students to use the relevant data of the internship. (2) through the evaluation of the office of IE Department, the content is considered to have research value. (3) a professor, who is qualified to instruct a master's degree candidate in the department, is willing to instruct you to finish a master's thesis on the achievement of the Internship.

**Procedure:** The thesis proposal should be completed before the end of the second semester. By the end of the third semester, the Department will organize a committee to check the progress of your thesis, which will be classified into three levels (good, fair and failed) according to the students' comprehensive abilities, thesis schedule, work attitude, and the time spent on the thesis. Only those who are classified into fair or higher level could continue their thesis research. Those who fail have to apply for extension of studies. Their supervisors will help them to find out the cause and then decide whether the students should repeat the proposal defense and the progress check again after one semester.

**Workload:** The thesis research duration should not be less than 800 hours, starting from the approved proposal defense to the final submission of Master Thesis.

### **3. Publication of Academic Papers**

Not Required