**元智大學工業工程與管理學系博士班 必選修科目表**

**（112學年度入學新生適用）**

**List of Required and Elective Courses for** **Doctoral Program of**

**Industrial Engineering and Management at Yuan Ze University**

**（Applicable to Students Admitted for the Academic year of 2023-2024）**

112.04.19 一一一學年度第六次教務會議通過

Passed by the 6th Academic Affairs Meeting, Academic Year 2022, on April 19, 2023

112.11.22 一一二學年度第五次教務會議修訂通過

Amended by the 5th Academic Affairs Meeting, Academic Year 2023, on November 22, 2023

113.05.01 一一二學年度第八次教務會議修訂通過

Amended by the 8th Academic Affairs Meeting, Academic Year 2023, on May 01, 2024

113.11.20 一一三學年度第二次教務會議修訂通過

Amended by the 2nd Academic Affairs Meeting, Academic Year 2024, on November 20, 2024

|  |  |  |  |
| --- | --- | --- | --- |
| **選修類別：決策最佳化與全球運籌管理**  Category: Optimization and Global Logistics Management | | | |
| 課號 | 中文課名 | 英文課名 | 學分數 |
| IE503 | 模擬學★ | Simulation | 3 |
| IE507 | 數學規劃（一）★ | Mathematical Programming (I) | 3 |
| IE518 | 時間序列分析★ | Time Series Analysis and Forecasting | 3 |
| IE520 | 田口式品質工程 | Taguchi Quality Engineering | 3 |
| IE533 | 機率分析★ | Probabilistic Analysis | 3 |
| IE537 | 高等設施規劃 | Advanced Facilities Planning | 3 |
| IE538 | 實驗設計★ | Experimental Design and Applications | 3 |
| IE541 | 決策分析 | Decision Analysis | 3 |
| IE576 | 全球運籌管理 | Global Logistics Management | 3 |
| IE579 | 運輸管理★ | Transportation Management | 3 |
| IE581 | 服務系統設計★ | Service System Design | 3 |
| IE591 | 物流系統 | Analysis of Material Flows and Distribution System | 3 |
| IE600 | 系統工程 | System Engineering | 3 |
| IE605 | 多變量分析 | Multivariate Analysis | 3 |
| IE607 | 啟發式最佳化★ | Heuristic Optimization | 3 |
| IE610 | 行動電子商務 | Mobile Commerce | 3 |
| IE613 | 供應鏈管理專題★ | Topics in Supply Chain Management | 3 |
| IE615 | 模糊工程與資訊 | Fuzzy Engineering and Information | 3 |
| IE618 | TFT-LCD產業分析與個案探討 | TFT-LCD Industry Analysis and Case Study | 3 |
| IE622 | 卓越經營管理★ | Managing for Business Excellence | 3 |
| IE630 | 進階專案管理★ | Advanced Project Management | 3 |
| IE631 | 永續發展 | Sustainable Development | 3 |
| **選修類別：智慧型生產與大數據分析**  Category: Intelligent Manufacturing and Big Data Analysis | | | |
| 課號 | 中文課名 | 英文課名 | 學分數 |
| IE508 | 人工智慧與專家系統專題 | Artificial Intelligence and Expert System Topics | 3 |
| IE510 | 電腦繪圖 | Computer Graphics | 3 |
| IE517 | 存貨系統與管制★ | Inventory Systems and Control | 3 |
| IE524 | 工程管理系統 | Engineering Management Systems | 3 |
| IE531 | 高等品質管制★ | Advanced Quality Control | 3 |
| IE534 | 生產排程★ | Production Scheduling | 3 |
| IE543 | 生產計劃 | Production Planning | 3 |
| IE544 | 電腦輔助設計與製造（一） | Computer-Aided Design and Manufacturing (I) | 3 |
| IE562 | 3D視覺模擬和虛擬實境★ | 3D Visual Simulation and Virtual Reality | 3 |
| IE565 | 人因工程 | Human Factors | 3 |
| IE566 | 可靠度工程 | Reliability Engineering | 3 |
| IE571 | 高等工程經濟 | Advanced Engineering Economics | 3 |
| IE574 | 資料視覺★ | Data Visualization | 3 |
| IE590 | 機器視覺應用★ | Machine Vision | 3 |
| IE592 | 及時生產系統 | Just-in-Time Production System | 3 |
| IE593 | 高等生產管制 | Advanced Production Control | 3 |
| IE599 | 資料探勘★ | Data Mining | 3 |
| IE614 | 資料模式辨識與分類★ | Data Pattern Recognition and Classification | 3 |
| IE619 | 虛擬實境系統設計與建構★ | Design and Construction of Virtual Reality Systems | 3 |
| IE623 | 人因設計 | Ergonomic Design | 3 |
| IE624 | 優使性工程★ | Usability Engineering | 3 |
| IE625 | 巨量資料分析 | Big Data Analytics | 3 |
| IE626 | 物聯網概論與實務★ | Introduction and Practice of Internet of Things (IoT) | 3 |
| IE627 | 區塊鏈原理與實務★ | Blockchain Principles and Practices | 3 |
| IE628 | 巨量資料分析(一) | Big Data Analytics (I) | 3 |
| IE629 | 巨量資料分析(二) | Big Data Analytics (II) | 3 |
| IE632 | 智慧製造 | Smart Manufacturing | 3 |
| IE633 | 生成式AI與大語言模型 | Generative AI and Large Language Model | 3 |
|  | | | |
| **選修類別：基礎共同** Category: Common Courses | | | |
| 課號 | 中文課名 | 英文課名 | 學分數 |
| IE608 | 科技英文★ | Technical Writing | 3 |
| IE999 | 研究方法論 | Research Methodology | 3 |

|  |  |
| --- | --- |
| 註：「★」表示可能以英語授課 Note: ★ indicates the course might be offered in English  備註  Remarks | 1. 修業規定 (Regulations for Course Selection)：本所博士班最低畢業總學分數必須滿足選修課程27學分與論文6學分，共計33學分。The minimum total credits required for graduation for the Doctoral Program is 30 credits, including 27credits of elective courses, and 6 credits of the dissertation. 2. 博士班學生選修碩士在職專班之課程，不列入畢業學分，須填寫「元智大學課程跨學制申請表」。PhD students taking In-service graduate courses are not allowed to be counted as graduation credits. Students who would like to apply for Cross-System Courses need to fill in the "Application for Cross-System Courses" form. 3. 選修非本系之課程，需先經指導教授及所長同意，且以9學分為上限。Students must obtain the consent of their advisor and the department chair before taking elective courses from other departments, with a maximum of 9 credits. 4. 入學研究生須依本校學術研究倫理教育課程實施要點規定，於入學第一學期結束前完成學術研究倫理教育課程，最遲須於申請學位口試前補修完成，未完成本課程，不得申請學位口試。For those graduate students who shall complete Academic Research Ethics Education Course before the end of their first academic semester, they must follow the regulations of Yuan Ze University Academic Research Ethics Education Course Implementation Highlights. The latest deadline for them shall be their course completions and then their applications towards the degree’s oral exam. 5. 其他未盡事宜，請參閱本系「博士班修讀辦法」。Students should refer to the "Regulations for PhD's Students" in the department for additional information. |

AA-CP-04-CF04 (1.2版)／101.11.15修訂

**PhD Program**

**Industrial Engineering and Management Department, Yuan Ze University**

(Applicable for the students enrolled in the academic year 2023/2024)

Passed by the 3th IEM Department Meeting, Academic Year 2023, on October 11, 2023

* **Course Requirements**

A minimum of 33 credit hours are required for graduation, which includes 27 credit hours for elective courses and 6 credit hours for dissertation.

* **Fundamental Qualifying Examination**

1. Graduate students are required to complete three out of the following five courses (taken in undergraduate or master period can be counted) in order to pass the Fundamental Qualifying Exam. The corresponding substitutes are also listed below:

|  |  |
| --- | --- |
| **Fundamental Qualifying Course Name**  **(Undergraduate Level)** | **Substitute Course Name**  **(Graduate Level)** |
| Production Planning and Control (I) | Advanced Production Planning and Control  Production Scheduling  Production Planning |
| Quality Control (with lab) | Advanced Quality Control |
| Engineering Statistics | Experimental Design  Probabilistic Analysis |
| Operations Research | Mathematical Programming (I) |
| Facilities Planning (with lab) | Advanced Facility Planning |

1. The abovementioned substitute courses can be counted toward the elective courses requirement if they are taken while studying during the IEM PhD program.
2. The ”Dissertation Adviser Agreement” must be completed and turned in after passing the Fundamental Qualifying Exam signed by the dissertation adviser.

* **Advanced Examination**

Student is required to complete the Fundamental Qualifying Examination and the course requirements before applying for the Advanced Examination. TheAdvanced Examination related rules are as follows:

1. Graduate student must complete the Academic Research Ethics Education Course according to the regulations of Yuan Ze University Academic Research Ethics Education Course Implementation Highlights, before the end of the first academic semester. At the latest, the course must be completed and passed before the Advanced Examination application. The student will not be allowed to proceed the Advanced Examination without completing the Academic Research Ethics Education Course completion.
2. PhD Graduate students should complete the Advanced Examination within the first 4 academic years (not including temporary leaves).
3. Prior to the Advanced Examination, the student must turn in the Application Form of the PhD Advanced Examination.
4. In accordance with the specialty and requests of dissertation committee members, the examination may be conducted in written, oral or both formats. The committee must be comprised of a minimum of three members (include the dissertation advisor), at least 1/3 of which should be associate (or above level) professor.
5. Upon completions of the Fundamental Qualifying Examination and Advanced Examination, the student becomes a PhD candidate.

* **Dissertation Proposal Defense**

Three months after passing the Advanced Examination, the PhD candidate can apply for the Dissertation Proposal Defense and form the dissertation committee comprising at least 5 members (including dissertation advisor) from in and outside of YZU with 1/3 or above from each. The related rules are as follows:

1. The committee members from the IEM department shall be the same as in the Advanced Exam. If any changes are needed, the PhD candidate must apply and obtain the committee agreement with IEM approval.
2. The committee is responsible for conducting oral examination with respect to the proposal and its relevance to the Industrial Engineering and Management professional field. A written examination of a specialized subject related to the proposed research may be requested by the committee.
3. Prior to the Proposal Defense, the PhD candidate must turn in ”Dissertation Proposal Check List”, ”Dissertation Advisor’s Recommendation” and ”Dissertation Proposal Form”. The student must turn in ”Dissertation Proposal Approval Form” after passing the Dissertation Proposal Defense.

* **Dissertation Defense**

Dissertation Defense can only be applied after three months of the Dissertation Proposal Defense and the completion of publication requirements. The related rules and regulations are as follows:

1. Two or more articles must be published in renowned journals, with at least one in SSCI/SCI class journals or two in EI class journals. The published articles must originate from and directed related to the dissertation and must be accepted with proven acceptance letters to satisfy publication requirements. Other than student’s dissertation adviser, the student needs to be the first author of the published articles. If the following situations occur, the number of papers will be counted differently:
   1. Articles with author(s) who is (are) not the student’s committee member(s): can only be counted as one-half paper.
   2. Articles with authors of other students: can only be counted as one-half paper.
   3. Articles with both cases i.) and ii.): can only be counted as one-fourth paper.
2. One or more conference papers are published in domestic or international conference proceedings and presented in international conference.
3. Committee members should be the same for both the Dissertation Proposal Defense and the Dissertation Defense. If not, the student must apply and obtain the committee agreement with IEM approval.
4. PhD students should complete the originality check for their dissertation before the defense, with a standard no higher than 20% for the comparison report. On the day of the defense, students should submit the "Dissertation Originality Comparison Report" to the advisor and the committee for review, and undergo an oral examination and a professional field conformity check. After completing the defense, students need to conduct another originality check on the final version of the dissertation and have it confirmed by the advisor. The final version of "Dissertation Professional Field Conformity Check Form," "Dissertation Originality Comparison Report," and the dissertation should be submitted to the department office for record.
5. Prior to the Dissertation Defense, the PhD candidate must turn in the ”Dissertation Defense Check List”. After the Dissertation Defense, the ”Final Defense Grading Report” and the ”Dissertation Defense Report Form” must be turned in to the IEM office.

**◎This regulation has been implemented with the approval of IEM departmental meeting. Any amendment will also be implemented with the same process.**