元智大學工業工程與管理學系 博士班

修課及資格考試辦法

（112學年度入學新生適用）

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

# 修課規定

修課必須滿足必修課程3學分、選修課程24學分與論文6學分，共計33學分。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，最遲須於申請進階考試前補修完成，未完成本課程，不得申請進階考試。必選修說明如下：

必修課程（3學分）：「IE608科技英文」3學分。入學前五年內之英文檢定成績若達以下標準，提出申請，經所長同意後始可抵免。

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| 全球英檢 | 劍橋大學英語能力認證分級測驗(Cambridge Main Suite) | 劍橋大學國際商務英語能力測驗(BULATS) | 外語能力測驗(FLPT) | 全民英檢 | CEP語言能力參考指標 | 托福(TOEFL) | 多益測驗(TOEIC) | 多益口說寫作測驗(TOEIC Speaking and Writing Tests) | 大學校院英語能力測驗(CSEPT) | IELTS | ILTEA國際英檢 |
| 三項筆試總分Written Total Score | 口試 Oral | 紙筆型態Written | 電腦型態CBT/IBT | 第二級2nd Level | ILTEA觀光餐旅英檢 |
| B2 | First Certificate in English (FCE) | ALTE Level 3(60-74) | 195-239 | S-2+ | 中高級 | B2(高階級) Vantage | 543以上 | 72以上 | 785以上 | 310以上 | 240-360 | 5.5以上 | B2中高級 |

選修課程至多可選修3門非本系之課程，需先經指導教授及所長同意。

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」。

# 基礎資格考試

博士班研究生基礎資格考試相關規定如下：

1. 博士班研究生必須完成下列五門課程中的任三門(含大學部修業或碩士班修業期間)，以通過基礎資格考試。五門課程可由下列對應課程替代。

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| **基礎資格考試課程名稱** | **對應替代課程** |
| 生產計劃與管制（一） | 高等生產管制、生產排程、生產計劃 |
| 品質管制（含實驗） | 高等品質管制 |
| 工程統計 | 實驗設計、機率分析 |
| 作業研究 | 數學規劃（一） |
| 設施規劃（含實驗） | 高等設施規劃 |

1. 資格考試之對應替代課程若為博士班修業期間完成，皆可承認至博士班畢業學分。
2. 通過基礎資格考試後，即應選定指導教授，並繳交「論文指導同意書」。

# 進階考試

必、選修課程修畢暨通過基礎資格考試後方得提出進階考試申請，進階考試相關規定如下：

1. 博士班研究生應於入學四年內(不含休學期間)通過進階考試。
2. 進行進階考試前，博士班研究生必須繳交「博士生進階考試申請表」。
3. 博士班研究生以口頭或/及書面方式進行報告，並由系上老師至少三名(含指導教授)組成委員會，其中至少三分之一應為副教授職級以上教師，委員依個人專長及要求出題進行測驗。
4. 通過基礎資格考試及進階考試者，為博士候選人。

# 博士論文提案考試

博士班研究生通過進階考試三個月後，始得提出論文提案考試申請，並申請成立論文委員會，委員(含指導教授)至少五名，其中校內外委員均各須佔三分之一以上，論文提案考試相關規定如下：

1. 論文提案考試之系上委員應與進階考試之系上委員相同，若更換系上委員必須提出申請並經論文委員會同意後，送系所核備。
2. 論文委員會委員得針對提案進行審查口試及專業領域相符性檢核，必要時得由論文委員會指定與論文研究相關之一專業科目進行筆試。
3. 進行提案考試前，博士候選人必須繳交「申請博士論文提案口試檢查表」、「博士班論文指導教授推薦函」與「博士論文提案申請書」，並于提案口試通過後，繳交「博士論文提案同意書」。

# 博士學位考試

博士班研究生通過論文提案考試三個月後，並滿足期刊論文與會議論文之發表規定，始得提出博士論文學位考試申請。期刊論文與會議論文之發表規定以及學位口試相關規定如下：

1. 發表於著名學術期刊論文二篇，其中至少一篇為SSCI/SCI期刊，或是二篇皆為EI類期刊。期刊論文內容必須與博士論文有直接相關。期刊論文在取得接受證明文件時，即滿足發表規定。發表的期刊論文除了指導教授外，博士班學生須為第一順位之作者，若有下列情形者，其篇數另計：
* 有非委員會委員之排名，篇數為0.5篇。
* 有其他學生排名，篇數為0.5篇。
* 若同時有上述兩種情況者，篇數為0.25篇。
1. 至少一篇發表於國內或國際學術會議論文，並於修業期間於「書報討論」課程中或「國際會議」進行英文專題報告至少一次。
2. 學位考試之委員應與提案考試之委員相同，若更換委員必須提出申請並經論文委員會同意後，送系所核備。
3. 博士生應於學位考試前完成論文原創性比對作業，比對報告標準以不超過20%為原則，並於學位考試當日進行專業領域相符性檢核並將「學位論文原創性比對報告書」送交指導教授及學位考試委員參考，進行畢業論文口試及專業領域相符性檢核。完成學位考試後，研究生需再次將最終定稿的論文進行原創性比對作業，並由指導教授確認無誤後，將「學位論文定稿原創性比對檢核表」、「學位論文原創性比對報告書」、及論文送交系辦公室備查。
4. 進行博士學位考試前，博士候選人必須繳交「申請博士論文畢業口試檢查表」，並于論文口試通過後，繳交「畢業論文口試評分表」與「博士論文口試委員審定書」。

# 本辦法經系(所)務會議通過後實施，修正時亦同。

**元智大學工業工程與管理學系博士班 選修科目表**

**（112學年度入學新生適用）**

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

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| **選修類別：決策最佳化與全球運籌管理** |
| 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 |
| 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** |
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| 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 |

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| **選修類別：基礎共同**  |
| 課號 | 中文課名 | 英文課名 | 學分數 |
| IE999 | 研究方法論 | Research Methodology | 3 |

註：「★」表示可能以英語授課

**PhD Program**

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

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

* **Course Requirements**

A minimum of 33 credit hours are required for graduation, which includes 3 credit hours for compulsory course, 24 credit hours for elective courses and 6 credit hours for dissertation. 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. Course requirement details are as follows:

1. Compulsory course (3 credit hours): ”IE608 Technological English” 3 credit hours – The student whose English examination result reaches the following criteria may apply for remittal.

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| Cambridge Main Suite | BULATS | FLPT | CEP | TOEFL | TOEIC | TOEIC Speaking and Writing Tests | CSEPT | IELTS | ILTEA |
| Written Total Score | Oral | Written | CBT/IBT | 2nd Level |
| First Certificate in English (FCE) | ALTE Level 3 (60-74) | 195-239 | S-2+ | B2 Vantage | 543 | 72 | 785 | 310 | 240-360 | 5.5 | B2  |

1. Elective courses (24 credit hours): The student can select up to 3 graduate courses from other departments at YZU to count toward graduation course requirements (3 of the 8) with the approvals of the dissertation adviser and the IEM Chair.
2. The credits of PhD students taking courses from the In-service Master's program are not counted toward graduation credits. Students need to fill out the “Cross-System Courses Application Form” if they plan to take such courses.

* **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 ControlProduction SchedulingProduction Planning |
| Quality Control (with lab) | Advanced Quality Control |
| Engineering Statistics | Experimental DesignProbabilistic 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. PhD Graduate students should complete the Advanced Examination within the first 4 academic years (not including temporary leaves).
2. Prior to the Advanced Examination, the student must turn in the Application Form of the PhD Advanced Examination.
3. 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.
4. 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.**

**元智大學工業工程與管理學系博士班 選修科目表**

**（112學年度入學新生適用）**

**List of Elective Courses for** **PhD Program of**

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

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

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| **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 |
| 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 |
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| 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 |

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| **選修類別：基礎共同** Category: Common Courses |
| 課號 | 中文課名 | 英文課名 | 學分數 |
| IE999 | 研究方法論 | Research Methodology | 3 |

註：「★」表示可能以英語授課

Note: ★ indictes the course might be offered in English