**元智大學工業工程與管理學系　必修科目表**

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

**List of Required Courses（112學年度入學新生適用）**

**(Applicable to Students Admitted in Academic Year of 2023)**

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

112.10.05 一一二學年度第二次教務會議修訂通過

Amended by the 2nd Academic Affairs Meeting, Academic Year 2023, on October 05, 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

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| 學年Academic Year  學期Semester  科目Subject | | 第一學年1st Academic Year | | | | | 第二學年2nd Academic Year | | | | | | 第三學年3rd Academic Year | | | 第四學年4th Academic Year | | | |
| 上Fall | | | 下Spring | | 上Fall | | | 下Spring | | | 上Fall | | 下Spring | 上Fall | | 下Spring | |
| 共同必修科目University Compulsory  （17） | | 國文（一）  Chinese (I)  （2） | | | 國文（二）  Chinese (II)  （2） | |  | | |  | | |  | |  |  | |  | |
| 英語（一）  English (I)  （2） | | | 英語（二）  English (II)  （2） | |  | | |  | | |  | |  |  | |  | |
| 外語課程應修習10學分。   1. 「英語（一）」及「英語（二）」為基礎課程，採能力分級上課，共計二學期四學分。 2. 除了「英語（一）」及「英語（二）」外，畢業前應修畢三個不同主題式英語課程，共三學期5學分。 3. 大一英語能力後測「TOEIC模擬測驗」成績未達350分者，應修習「應試加強班」(EL260)。修習「應試加強班」期間之期末TOEIC模擬測驗成績未達350分者，則該科成績將「不及格」，並應再次修習「應試加強班」，直到取得TOEIC模擬測驗分數達350分(含)始得修習其他主題式英語課程。 4. 另開設「英語檢定」(EL360)計一學期1學分，「英語檢定」之修課限制與注意事項，請參照「通識外語『英語檢定』修課規定」，並由通識教學部公佈後施行。   外國學生改修華語須經國際語言文化中心審核通過始可改修華語課程10學分，其華語課程10學分應含「華語檢定」1學分，「華語檢定」修課限制與注意事項，請參照「通識外語『英語檢定』修課規定」。  凡本校大學部外國學生修習「華語(一)」或「華語(二)」任一課程成績未達60分，不得修習「華語(三)」、「華語(四)」。若修習「華語(三)」、「華語(四)」任一課程成績未達60分，不得修習「華語(五)」或「華語檢定」(EL372)。  The undergraduate students must complete 10 required credits of foreign language courses.   1. English (I) & (II) for the total 4 credits: English (I) and (II) are 4 credit elementary courses for the freshmen who are grouped on English competence; to complete within two semesters. 2. English thematic course for the total 5 credits: English thematic courses are 5-credit English courses; students are required to obtain 5 credits through 3 different thematic courses for graduation. 3. Students who do not reach the 350-point threshold of TOEIC Mock Exam in the end of the freshman year must take “English Testing” (EL260) course. Students will fail the course if they do not score higher than 350 points in TOEIC Mock Exam by the end of the course, and must repeatedly take the course until they can score higher than 350 points. 4. “English Testing” (EL360) for the total 1 credit: For the requirements of registering “English Testing”, please refer to "the Regulation for Registering English Test" announced and implemented by the College of General Education.   Foreign students need approval by ILCC for taking 10 credits of Mandarin Chinese courses as alternative courses of English.  The undergraduate foreign students must pass Mandarin Chinese (I) and (II) before taking Mandarin Chinese (III) and (IV). Students must pass Mandarin Chinese (III) and (IV) before taking Mandarin Chinese (V) and Chinese Proficiency Test (EL372).  英語檢定English Testing（1）、經典選讀A Guide to Classics (2) 、服務學習Service Learning（1） | | | | | | | | | | | | | | | | | |
| 體育Physical Education（0） | | 體育Physical Education（0） | | | | 興趣選項體育optional physical education（0） | | | 興趣選項體育optional physical education（0） | |  | |  |  | |  | |
| 大學部必須修習4學期體育課程；其中2學期為大一體育課程原班級上課，另2學期為興趣選項體育課程。  The undergraduate students must attend the physical education course for 4 semesters; 2 semesters for the freshman physical education  courses, the other two semesters for the optional physical education courses. | | | | | | | | | | | | | | | | | |
| 通識教育科目General Education  （10） | | 通識課程分為人文藝術、自然科學、社會科學及生命科學四大類。學生須於四大領域中各選修2學分課程，共計8學分。General Education program comprises four categories：Humanities, Natural Science, Social Science and Life Science. Students are required to take a 2-credit course from each category to get 8 credits before graduation.  通識跨域課程General Education Interdisciplinary Course：此2學分學生可自由於通識講座課程、微課自主學習或在地多元文化課群中選課。惟外籍生與工程學院英語學士班、資訊學院英語學士班、人文社會學院英語學士班、電機通訊學院英語學士班學生仍須於四大領域中選課，依各院修課規定辦理。Students can select the 2 credits from a General Education Lecture course, Micro Credit courses, Self-Study courses, or Local-Multicultural courses. Only foreign students and undergraduates of International Programs in the Colleges of Engineering, Informatics, Humanities and Social Sciences, as well as Electrical and Communication Engineering are required to take a 2-credit course from the four categories according to each college’s policy before graduation. | | | | | | | | | | | | | | | | | |
| 院必修科目  College  Compulsory  （4） | | 程式語言共4學分，依各院修課規則辦理。  The Fundamental Computer Programming has 4 credits in total, which is subject to the rules of each college. | | | | | | | | | | | | | | | | | |
| 系必修  科目Department Compulsory  (71) | 人格特質課程 | 問題創意思解  Creative Problem Solving  IE232  (2) |  | | |  | | | 工程溝通與倫理  Engineering Communication and Ethics  IE238  (2) | | |  | | 研究方法  Research Methodology  IE233  (2) | | |  | |  |
| 核心專業課程 | 微積分（一）  Calculus(I)  IE109  (3) | 微積分（二）  Calculus(II)  IE110  (3) | | | 工程統計  Engineering Statistics  IE203  (3) | | | 工程統計（二）  Engineering Statistics(II)  IE204  (3) | | | 作業研究  Operations Research  IE303  (3) | | 作業研究（二）  Operations Research(II)  IE329  (3) | | | 畢業專題  Graduation Project  IE439  (3) | | 工業工程實務  專題  Practical Operations of Industrial Engineering IE426  (1) |
| 工業工程概論  Introduction to Industrial Engineering  IE101  (3) | 工程圖學  Engineering Graphics  IE114  (3) | | | 製造程序  Manufacturing Processes  IE209  (3) | | | 網路資訊應用  Network Information Application IE212 (3) | | | 生產計劃與管制（一）  Production Planning and Control(I)  IE335  (3) | | 生產計劃與管制 (含實驗) （二）  Production Planning and Control(II) IE348  (3) | | |  | |  |
| 資訊概論  Basic Concepts of Information Technology  IE117  (2) | 線性代數  （含演習）  Linear Algebra  IE217  (4) | | | 資料庫管理系統  Database Management Systems  IE406 (3) | | | 工程經濟  Engineering Economics IE308  (3) | | | 品質管制 （含實驗）  Quality Control (Lab) IE350  (3) | | 設施規劃 （含實驗）  Facilities Planning IE349  (3) | | |  | |  |
| 資訊概論實務  Basic Concepts of Information Technology : Lab  IE118  (1) | 工作研究  Work Study  IE211  (3) | | | 人因工程（一）  Human Factors(I)  IE220  (3) | | |  | | |  | |  | | |  | |  |
| 學期學分小計Credit each semester | | 11 | 13 | | | 12 | | | 11 | | | 9 | | 11 | | | 3 | | 1 |
| 備註Remarks | | \*\* **最低畢業學分：必修：102學分；選修：26學分。**  \*\* Minimum graduation requirement: complete both 105 credits for required courses and 23 credits for elective courses.   1. 一年級之「工業工程概論」為基礎課程，除轉學生補修之同學需在入學第一年內修得此學分，其他同學必需在一年級內修完。Introduction to Intelligent Production IE101 must be completed within the 1st year enrolled in IEM major, which includes both freshman & transferred student. 2. 「工業工程實務專題」須於大四下學期修習，但成績優異符合提前畢業者可另案申請。Practical Operations of Industrial Engineering IE426 must be taken in the 2nd semester of senior year. However, student with top grade or exceptional performance can apply for early completing. 3. 擋修科目：prerequisite   微積分（一）Calculus (I) （須達及格60分） → 微積分（二）Calculus (II)、  微積分（二）Calculus (II) （須達及格60分） → 工程統計Engineering Statistics、  工程統計 Engineering Statistics （須達50分）→工程統計（二）Engineering Statistics (II)、  工程統計Engineering Statistics（須達及格60分） → 品質管制(含實驗) Quality Control (Lab)   1. 擋修科目若不及格，必須連續重修（不准隔年重修）；違反規定者，不給成績。Not satisfying prerequisite, student must re-take the course immediately (skipping is not allowed); grades will not be issued for any one not following the regulation. 2. 有關共同必修及通識教育科目之詳細規定，另依據「元智大學共同必修科目表」之規定辦理。   Please refer to Yuan Ze University Common Required Course List for General Education courses information and regulations.   1. 通識教育科目學分只採計至多10學分，超修之學分將不列入畢業學分。   The maximum credits for general education courses is 10, the exceeding credits will not be counted.   1. 「IE439畢業專題」為終端學習課。IE439 Graduation Project serves as the terminal learning course. 2. 課程「IE220人因工程（一）」及「IE232問題創意思解」為本系必修「議題導向實作專題課程」   Course code IE220,Course code IE232 are compulsory courses of "Topic and Implementation-oriented courses"   1. 畢業前須修習通過至少2門「數位應用相關課程」，可至本系或外系修習。本系「數位應用相關課程｣ 包含基礎物聯網應用與實作(IE122)、網路資訊應用(IE212)、系統模擬與應用(IE247)、3D互動數位內容製作(IE351)、資料庫管理系統(IE406)、多媒體應用(IE427)、深度學習神經網路概論與實作(IE438)、資料視覺(IE574)、虛擬實境系統設計與建構 (IE619)、物聯網概論與實務(IE626)、巨量資料分析(一) (IE628)及巨量資料分析(二) (IE629)等課程。   Students require taking passing at least two 'digital application courses'. Fundamental Applications and Practices of Internet of Things(IE122), Network Information Application (IE212), System Simulation and Applications(IE247), Implementation of 3D Interactive Digital Content (IE351), Database Management Systems (IE406), Multimedia Application (IE427), Introduction and Practices to Deep Learning Neural Networks(IE438), Data Visualization(IE574), Design and Construction of Virtual Reality Systems(IE625), Introduction and Practice of Internet of Things (IoT)( IE626), Big Data Analytics(I)(IE628), Big Data Analytics(II)(IE629) are courses of 'digital application courses'. (Student may take 'digital application courses' from another department.)   1. 本系同學總共必須修滿128學分方可畢業，包括共同必修、通識課程、及院必修共31學分、（外系選修至多承認17學分，與他系合作之學程，依學程規定承認最高學分）。   Student of Dept. of Ad must take 128 credits in total for graduation, include Required Common Courses and General Education courses (31), Department Compulsory courses (74), and Department Elective courses (23). (Outside the Department of elective up to recognize the (17) credits, and the cooperation courses with other departments, according to the provisions of the highest recognition of credit)   1. 畢業前需完成一個學程，包含本系學程、本系參與之跨院系學程。凡修畢前述學程，將由本系授與各學程證書。   IEM will issue Program completion certificate upon completing IEM required program.  Must complete a program prior graduation, including IEM program and Interdisciplinary Course Program. | | | | | | | | | | | | | | | | | |

**元智大學工業工程與管理學系　選修科目表**

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

**List of Elective Courses（112學年度入學新生適用）**

**(Applicable to Students Admitted in Academic Year of 2023)**

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

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| 學年Academic Year  學期Semester  科目Subject | 類  組  class | 第一學年1st Academic Year | | 第二學年2nd Academic Year | | 第三學年3rd Academic Year | | 第四學年4th Academic Year | |
| 上Fall | 下Spring | 上Fall | 下Spring | 上Fall | 下Spring | 上 | 下 |
|  | 工業組織與管理  Industrial Organization and Management  IE230  (3) | 工業設計  Introduction to Industrial Design  IE121  (3) | 服務業管理概論  Introduction to Service Management  IE423  (3) | 資訊安全與規範  Information Security and Policy  IE235  (3) | 服務工程  Service Engineering  IE245  (3) | 應用電子商務  Practical Electronic Commerce  IE337  (3) | 系統工程  Systems Engineering  IE410  (3) | 資料分析  Data Analysis IE428  (3) |
|  | 基礎物聯網應用與實作  Fundamental Applications and Practices of Internet of Things  IE122  (3) | 產品設計思維  Product Design  IE243  (3) | 服務科學導論  Introduction to Service Sciences  IE244  (3) | 3D互動數位內容製作  Implementation of 3D Interactive Digital Content  IE351  (3) | RFID資訊系統  IE353  RFID Information System  (3) | 3D視覺模擬和虛擬實境  3D Visual Simulation and Virtual Reality  IE562  (3) | 全面品質管理  Total Quality Management  IE407  (3) |
|  |  | RFID概論  Introduction to RFID  IE120  (3) | 人因工程（二） Human Factors(II)IE313 (3) | 採購管理  Procurement Management  IE342  (3) | 物流管理 Logistics Management IE312 (3) | 行動電子商務  Mobile Commerce  IE610  (3) | 行銷學  Marketing  IE435  (3) |
|  |  |  | 行動應用程式設計與開發  Design and Development of Mobile Application  IE356  (3) | 國際物流管理  Internationl Logistics Management  IE352  (3) | 應用統計分析  Applied Statistical Analysis IE304 (3) | 高等設施規劃  Advanced Facilities Planning  IE537  (3) | 物料管理  Material Management  IE322  (3) |
|  |  |  | 智慧生產概論  Introduction to Intelligent Production  EG201  (3) | 統計建模與電腦化實作  Statistical Modeling and Computerized Implementations  IE237  (3) | 工業安全  Industrial Safety  IE326  (3) | 實驗設計  Experimental Design and Applications  IE538  (3) | 深度學習神經網路概論與實作  Introduction and Practices to Deep Learning Neural Networks  IE438  (3) |
|  |  |  | 系統模擬與應用  System Simulation and Applications  IE247  (3) | 近代網路應用  Networks and Contemporary Applications  IE392  (3) | 電路板基礎工程  General Printed Circuit Board Technology  IE346  (3) | 及時生產系統  Just-in-Time Production Systems  IE592  (3) | 優使性工程  Usability Engineering  IE624  (3) |
|  |  |  | 工業會計  Industrial Accounting  IE301  (3) | 可靠度工程  Reliability Engineering  IE315  (3) | 雲端科技與服務  Cloud Computing Technology and Services  IE354  (3) | 電腦繪圖  Computer Graphics IE510 (3) | 虛擬實境系統設計與建構  Design and Construction of Virtual Reality Systems IE619(3) |
|  |  |  |  | 半導體製造  工程  IE347  Introduction to Semiconductor Manufacturing Technology  (3) | 專案管理  Project Management  IE375  (3) | 模擬學  Simulation IE503 (3) | 生產排程  Production Scheduling  IE534  (3) |
|  |  |  |  |  | 醫療品質管理Quality Management in Healthcare  IE376  (3) | 服務系統設計  Service Systems Design  IE581  (3) | 資料視覺  Data Visualization  IE574  (3) |
|  |  |  |  |  |  | 企業實習(A)  Internship(A)  IE445  (3) | 時間序列分析  Time Series Analysis and Forecasting  IE518  (3) |
|  |  |  |  |  |  | 企業實習(B)  Internship(B)  IE446  (3) | 電腦輔助設計與製造I Computer-Aided Design and Manufacturing(I)  IE544  (3) |
|  |  |  |  |  |  |  | 物聯網概論與實務Introduction and Practice of Internet of Things (IoT)  IE626  (3) |
|  |  |  |  |  |  |  | 巨量資料分析(一)  Big Data  Analytics(I)  IE628  (3) |
|  |  |  |  |  |  |  | 巨量資料分析(二)  Big Data  Analytics(II)  IE629  (3) |
|  |  |  |  |  |  |  | 企業實習(C)  Internship(C)  IE447  (3) |

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