國立東華大學

# 教學計劃表 Syllabus

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|---|---|---|---|---|---|
| 課程名稱(中文)<br>Course Name in Chinese | 金屬材料 | | | 學年/學期<br>Academic Year/Semester | 114/1 |
| 課程名稱(英文)<br>Course Name in English | Metallic Materials | | | | |
| 科目代碼<br>Course Code | MS__D1140 | 系級<br>Department & Year | 博士 | 開課單位<br>Course-Offering Department | 材料科學與工程學系 |
| 修別<br>Type | 選修 Elective | 學分數/時間<br>Credit(s)/Hour(s) | 3.0/3.0 | | |
| 授課教師<br>Instructor | /陳俊良 | | | | |
| 先修課程<br>Prerequisite | | | | | |

## 課程描述 Course Description

This course aims to offer students with knowledge of the metallurgy of steel alloys, stainless steels, aluminum, magnesium, titanium alloys and nickel supper alloys. The contents also include material heat treatment, fabrication and major applications to give a more comprehensive coverage of the subject. Microstructure/property relationships and the role of the individual alloying elements will also be introduced in this course.

## 課程目標 Course Objectives

This course equips students with a comprehensive understanding of the mechanical properties of materials, preparing them for future careers and research.

| | 系專業能力<br>Basic Learning Outcomes | 課程目標與系專業能力相關性<br>Correlation between Course Objectives and Dept.'s Education Objectives |
|---|---|---|
| A | 具備材料科學所需的進階物理、化學及數學的知識。Acquire required advanced physical, chemical, and mathematic knowledge for materials science and engineering. | ○ |
| B | 具備材料科學的進階專業知識，並能應用於解決工程上之問題。Acquire required advanced professional knowledge for materials science and engineering, applicable in solving engineering problems. | ● |
| C | 具備獨立研究之能力。Equipped with capabilities of independent research. | |
| D | 具備專業道德及責任感，與良好的溝通及團隊合作的能力。Acquire professional morality and responsibility, and capability of quality communication and team cooperation. | ○ |
| E | 具備進階的英文能力，應用於學習與交流。Acquire English capability used for learning and interaction. | ○ |

圖示說明Illustration ：● 高度相關 Highly correlated ○中度相關 Moderately correlated

## 授 課 進 度 表 Teaching Schedule & Content

| 週次Week | 內容 Subject/Topics | 備註Remarks |
|---|---|---|
| 1 | Introduction | |
| 2 | Carbon and alloy steels | |
| 3 | Stainless steels (I) | |
| 4 | Stainless steels (II) | |

| | | |
|---|---|---|
| 5 | Aluminum alloys (I) | |
| 6 | Aluminum alloys (II) | |
| 7 | Magnesium alloys | |
| 8 | Titanium alloy | |
| 9 | 期中考試週 Midterm Exam | |
| 10 | Nickel & Super Alloys (I) | |
| 11 | Nickel & Super Alloys (II) | |
| 12 | Mechanical metallurgy (I) | |
| 13 | Mechanical metallurgy (II) | |
| 14 | Metal joining (I) | |
| 15 | Metal joining (II) | |
| 16 | Metal forming | |
| 17 | Metal Extrusion | |
| 18 | 期末考試週 Final Exam | |

教 學 策 略 Teaching Strategies

☑ 課堂講授 Lecture ☑ 分組討論Group Discussion ☐ 參觀實習 Field Trip

☐ 其他Miscellaneous:

教 學 創 新 自 評 Teaching Self-Evaluation

創新教學(Innovative Teaching)

☐ 問題導向學習(PBL) ☐ 團體合作學習(TBL) ☐ 解決導向學習(SBL)

☐ 翻轉教室 Flipped Classroom ☐ 磨課師 Moocs

社會責任(Social Responsibility)

☐ 在地實踐Community Practice ☐ 產學合作 Industy-Academia Cooperation

跨域合作(Transdisciplinary Projects)

☐ 跨界教學Transdisciplinary Teaching ☐ 跨院系教學Inter-collegiate Teaching

☐ 業師合授 Courses Co-taught with Industry Practitioners

其它 other: _____

| 學期成績計算及多元評量方式 Grading & Assessments | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 配分項目<br>Items | 配分比例<br>Percentage | 多元評量方式 Assessments | | | | | | | |
| | | 測驗<br>會考 | 實作<br>觀察 | 口頭<br>發表 | 專題<br>研究 | 創作<br>展演 | 卷宗<br>評量 | 證照<br>檢定 | 其他 |
| 平時成績(含出缺席)<br>General Performance<br>(Attendance Record) | 15% | | ✓ | | | | | | |
| 期中考成績 Midterm Exam | 30% | | | ✓ | | | | | |
| 期末考成績 Final Exam | 30% | ✓ | | | | | | | |
| 作業成績 Homework and/or<br>Assignments | 15% | | ✓ | | | | | | |
| 其他 Miscellaneous<br>(_____) | 10% | | ✓ | | | | | | |

評量方式補充說明
Grading & Assessments Supplemental instructions

教科書與參考書目（書名、作者、書局、代理商、說明）
Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

1. W.F. Smith, Structure and Properties of Engineering Alloys, McGraw-Hill, 1993.
2. Ian Polmear, Light Alloys: Metallurgy of the Light Metals, Butterworth-Heinemann; 3 edition, 1995.
3. Gary S. Was, Fundamentals of Radiation Materials Science: Metals and Alloys, Springer, 2007.

課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)
Teaching Aids & Teacher's Website(Including online teaching information.
Personal website can be listed here.)

線上教學網址：
https://meet.google.com/dej-kmfq-qcr

其他補充說明 (Supplemental instructions)