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| 課程流水號 Serial Number | 24026 |
| 課號 Course Number | LS5082 |
| 班次 Class | * |
| 科目名稱(中文) Course Title(in Chinese) | 毒性檢測與替代方法 |
| 科目名稱(外文) Course Title(In English or other languages) | New approach methodologies(NAMs) in toxicity testing |
| 授課老師(中文) Instructor(in Chinese) | 鄭獻仁 |
| 授課老師(外文) Instructor(In English or other languages) | Hsien-Jen Cheng |
| 辦公時間(中文) Office Hour(in Chinese) | 五/56 |
| 辦公時間(外文) Office Hour(In English or other languages) | 五/56 |
| 課程目標(中文) Course Objective(in Chinese) | <ol style="list-style-type: none"> 1. Understanding the 3R (Reduction, Refinement and Replacement) concept for more ethical use of animals in testing. 2. Comprehensive studies on the regulations and development of alternative methods (or new approach methodologies). 3. Learning routine testing methods (like OECD testing guidelines) for toxicological and ecotoxicological endpoints. |
| 課程目標(外文) Course Objective(In English or other languages) | <ol style="list-style-type: none"> 1. Understanding the 3R (Reduction, Refinement and Replacement) concept for more ethical use of animals in testing. 2. Comprehensive studies on the regulations and development of alternative methods (or new approach methodologies). 3. Learning routine testing methods (like OECD testing guidelines) for toxicological and ecotoxicological endpoints. |

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| 授課內容(中文) Course Description(in Chinese) | <ol style="list-style-type: none"> 1. Course Introduction 2. The 3R concept and alternative test methods 3. Regulations and OECD testing guidelines 4. Skin irritation and corrosion 5. Eye irritation and serious damage 6. Skin sensitisation 7. Adverse Outcome Pathway (AOP) 8. IATA and Defined Approaches (DA) 9. Midterm Exam 10. Genotoxicity 11. Developmental and reproductive toxicity 12. Ecotoxicology testing 13. Other toxicological endpoints 14. In silico analysis 15. Other new developing alternative test methods 16. Group Presentation I 17. Group Presentation II 18. Final Exam |
| 授課內容(外文) Course Description(In English or other languages) | <ol style="list-style-type: none"> 1. Course Introduction 2. The 3R concept and alternative test methods 3. Regulations and OECD testing guidelines 4. Skin irritation and corrosion 5. Eye irritation and serious damage 6. Skin sensitisation 7. Adverse Outcome Pathway (AOP) 8. IATA and Defined Approaches (DA) 9. Midterm Exam 10. Genotoxicity 11. Developmental and reproductive toxicity 12. Ecotoxicology testing 13. Other toxicological endpoints 14. In silico analysis 15. Other new developing alternative test methods 16. Group Presentation I 17. Group Presentation II 18. Final Exam |
| 教科書/參考書(中文) Textbook/References(in Chinese) | OECD testing guidelines and related papers |
| 教科書/參考書(外文) Textbook/References(In English or other languages) | OECD testing guidelines and related papers |
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| 自編教材比例 Self-compiled Textbook/References Proportion | |
| 授課方式 Requirements | 講授Lecture 研討Seminar |
| 評量配分比重(中文) Grading(in Chinese) | 期中考 (20%)+ 期末考 (20%) + 分組報告/書面報告 (30%) + 出席/參與表現 (30%) =100% |
| 評量配分比重(外文) Grading(In English or other languages) | Midterm exam (20%)+ Final exam (20%) +Presentation/Oral Exam (30%) +Attendance/participation (30%) =100% |
| 課程所屬學制 Educational System | 博士班(Doctoral Programme) |
| 課程領域 Course Domain | 進階學科 生理 生物科技 環境生物 生物資訊 |
| 跨系課程領域 Cross Department Course Domain | |

| 系所核心能力 Core Competencies of Department | 強度指數 Overall Rating | | | | | | 評量方式 Corresponding Assessments |
|----------------------------------------------|--------------------------|---------------------------------|---------------|-------------------|----------------|------------------------------|-----------------------------------|
| | 0 不 具 備 Zero | 1 非 常 低 Very Low | 2 低 Low | 3 普通 Medium | 4 高 High | 5 非常 高 Very High | |
| | | | | | | | |

| 系所核心能力 Core Competencies of Department | 0 | 1 | 2 | 3 | 4 | 5 | 評量方式 Corresponding Assessments |
|------------------------------------------------------------------------|-------------|-----------------|----------|--------------|-----------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | 不具備 Zero | 非常低 Very Low | 低 Low | 普通 Medium | 高 High | 非常高 Very High | |
| 強度指數 Overall Rating 高等生物專業知識 Advanced Biological Sciences | ● | ● | ● | ● | ● | ● | <input checked="" type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input checked="" type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment) |

| <div>強度指數</div> <div>Overall Rating</div> <div>系所核心能力</div> <div>Core Competencies of Department</div> | 0 不具備 Zero | 1 非常低 Very Low | 2 低 Low | 3 普通 Medium | 4 高 High | 5 非常高 Very High | 評量方式 Corresponding Assessments |
|--------------------------------------------------------------------------------------------------------|------------------|----------------------|---------------|-------------------|----------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 創新及整合研究 Innovative and integrative research | ● | ● | ● | ● | ● | ● | <input checked="" type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input checked="" type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment) |

| 強度指數 Overall Rating 系所核心能力 Core Competencies of Department | 0 | 1 | 2 | 3 | 4 | 5 | 評量方式 Corresponding Assessments |
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| | 不具備 Zero | 非常低 Very Low | 低 Low | 普通 Medium | 高 High | 非常高 Very High | |
| 專業寫作與表達 Professional writing and presentation | ● | ● | ● | ● | ● | ● | <input checked="" type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input checked="" type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment) |

| 強度指數 Overall Rating 系所核心能力 Core Competencies of Department | 0 | 1 | 2 | 3 | 4 | 5 | 評量方式 Corresponding Assessments |
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| | 不具備 Zero | 非常低 Very Low | 低 Low | 普通 Medium | 高 High | 非常高 Very High | |
| 國際觀 International vision | ● | ● | ● | ● | ● | ● | <input checked="" type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input checked="" type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment) |