

課程中文名稱 Title of Course in Chinese : **軟體工程**

課程英文名稱 Title of Course in English : **Software Engineering**

應修系級 Major : **資訊管理研究所2 ,**

授課教師 Instructor : **戴敏育**

選修類別 Required/Elective : **選**

全半學年 Whole or Half of the Academic Year : **半學年**

學 分 Credit(s) : **3** 學分

時 數 Hour(s) : **3** 小時

教師網址 Instructor's Website : <http://web.ntpu.edu.tw/~myday/>

教師專長 Instructor's Specialty : 電子商務 (Electronic Commerce), 金融科技 (Financial Technology), 人工智慧 (Artificial Intelligence), 大數據分析 (Big Data Analytics), 資料探勘與文字探勘 (Data Mining and Text Mining)

課綱附檔 Attachments :

先修科目 : 無

Prerequisites : None

教學目標 :

1. 瞭解軟體工程基本概念、研究議題、與實務操作。
2. 具備軟體工程實務操作能力。
3. 進行軟體工程相關之資訊管理研究。

Course Objectives :

1. Understand the fundamental concepts and research issues of software engineering.
2. Equip with Hands-on practices of software engineering.
3. Conduct information systems research in the context of software engineering.

內容綱要 :

本課程介紹軟體工程基本概念、研究議題、與實務操作。課程內容包括軟體工程概論、軟體產品與專案管理：軟體產品管理，原型設計、敏捷軟體工程：敏捷方法、Scrum、極限程式設計、功能、場景和故事、軟體架構：架構設計、系統分解、分散式架構、基於雲的軟體：虛擬化和容器、軟體即服務、雲端運算與雲軟體架構、微服務架構：RESTful服務、服務部署、安全和隱私、可靠的程式設計、測試：功能測試、測試自動化、測試驅動的開發、程式審查、DevOps和程式碼管理：程式碼管理和DevOps自動化、及軟體工程個案研究。

Course Outline :

This course introduces the fundamental concepts, research issues, and hands-on practices of software engineering. Topics include Introduction to Software Engineering, Software Products and Project Management: Software product management and prototyping, Agile Software Engineering: Agile methods, Scrum, and Extreme Programming, Features, Scenarios, and Stories, Software Architecture: Architectural design, System decomposition, and Distribution architecture, Cloud-Based Software: Virtualization and containers, Everything as a service, Software as a service, Cloud Computing and Cloud Software Architecture, Microservices Architecture, RESTful services, Service deployment, Security and Privacy, Reliable Programming, Testing: Functional testing, Test automation, Test-driven development, and Code reviews, DevOps and Code Management: Code management and DevOps automation, and Case Study on Software Engineering.

學生核心能力關連(Student's Core Competence) :  
(八大核心能力為百分比；合計100%；Total 100%)

資訊管理研究所 110年 系核心能力：  
資訊科技新知探索與系統開發應用 90 %  
網路行銷企劃能力 0 %  
論文寫作與獨立研究能力新知 10 %

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## Four Fundamental Qualities

專業 Professionalism		人際 Interpersonal Relationship		倫理 Ethics		國際觀 International Vision	
創意思考 與問題解 決 (Creative thinking and Problem- solving) 30 %	綜合統整 (Comprehensive Integration)  30 %	溝通協調 (Communication and Coordination)  10 %	團隊合作 (Teamwork)  10 %	誠信正直 (Honesty and Integrity)  5 %	尊重自省 (Self- Esteem and Self- reflection)  5 %	多元關懷 (Caring for Diversity)  5 %	跨界宏觀 (Interdisciplinary Vision)  5 %

商學院學習目標(College Learning Goals) :

Ethics/Corporate Social Responsibility

Global Knowledge/Awareness

Communication

Analytical and Critical Thinking

系所學習目標(Department Learning Goals) :

Information Technologies and System Development Capabilities

Research capabilities

教學進度(Teaching Contents) :

週別 (Weekly Schedule)	日期 (Date)	教學預定進度 (Tentative teaching schedule) (若有調整，依教師實際授課為準; Adjustments are made according to instructor's actual teaching schedule)	教學方法與教學活動 (Teaching methods and activities)
Week 1	20210923	軟體工程概論 (Introduction to Software Engineering)	講授Lecture 討論Discussion 實習Practicum
Week 2	20210930	軟體產品與專案管理：軟體產品管理，原型設計 (Software Products and Project Management: Software product management and prototyping)	講授Lecture 討論Discussion 實習Practicum
Week 3	20211007	敏捷軟體工程：敏捷方法、Scrum、極限程式設計 (Agile Software Engineering: Agile methods, Scrum, and Extreme Programming)	講授Lecture 討論Discussion 實習Practicum
Week 4	20211014	功能、場景和故事 (Features, Scenarios, and Stories)	講授Lecture 討論Discussion 實習Practicum
Week 5	20211021	軟體工程個案研究 I (Case Study on Software Engineering I)	討論Discussion
Week 6	20211028	軟體架構：架構設計、系統分解、分散式架構 (Software Architecture: Architectural design, System decomposition, and Distribution architecture)	講授Lecture 討論Discussion 實習Practicum
Week 7	20211104	基於雲的軟體：虛擬化和容器、軟體即服務 (Cloud-Based Software: Virtualization and containers, Everything as a service, Software as a service)	講授Lecture 討論Discussion 實習Practicum
Week 8	20211111	期中報告 (Midterm Project Report)	討論Discussion
Week 9	20211118	雲端運算與雲軟體架構 (Cloud Computing and Cloud Software Architecture)	講授Lecture 討論Discussion 實習Practicum
Week 10	20211125	微服務架構：RESTful服務、服務部署 (Microservices Architecture, RESTful services, Service deployment)	講授Lecture 討論Discussion 實習Practicum
Week 11	20211202	軟體工程產業實務 (Industry Practices of Software)	討論Discussion

		Engineering)	
Week 12	20211209	軟體工程個案研究 II (Case Study on Software Engineering II)	討論Discussion
Week 13	20211216	安全和隱私 (Security and Privacy) 可靠的程式設計 (Reliable Programming)	講授Lecture 討論Discussion 實習Practicum
Week 14	20211223	測試：功能測試、測試自動化、測試驅動的開發、程式碼審查 (Testing: Functional testing, Test automation, Test-driven development, and Code reviews) DevOps和程式碼管理：程式碼管理和DevOps自動化 (DevOps and Code Management: Code management and DevOps automation)	講授Lecture 討論Discussion 實習Practicum
Week 15	20211230	期末報告 I (Final Project Report I)	討論Discussion
Week 16	20220106	期末報告 II (Final Project Report II)	討論Discussion
Week 17	20220113	學生自主學習 (Self-learning)	討論Discussion
Week 18	20220120	學生自主學習 (Self-learning)	討論Discussion

評量方式(Evaluation Methods)：

課堂之前測(Pre-test) 0 %

課堂之隨堂測驗(Quiz) 0 %

期中考-筆試(Mid-Term) 0 %

期末考-筆試(Final Exam) 0 %

個案分析報告(Case Report) 10 %

課堂參與(Class Participation) 10 %

個人報告(Individual Presentation) 60 %

團體報告(Group Presentation) 10 %

作業(Assignment) 10 %

其他評量方式(Other Evaluation Methods)

指定用書(Required Texts)：

Ian Sommerville (2019), Engineering Software Products: An Introduction to Modern Software Engineering, Pearson.

參考書目(Reference Books)：

Ian Sommerville (2015), Software Engineering, 10th Edition, Pearson.

Titus Winters, Tom Manshreck, and Hyrum Wright (2020), Software Engineering at Google: Lessons Learned from Programming Over Time, O'Reilly Media.

其他參考資料(Other References)：

『請遵守智慧財產權』及『不得非法複製及影印』

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