

南臺科技大學 106 學年度第 2 學期課程資訊

課程代碼	1ND01Q01
課程中文名稱	科學思維與方法
課程英文名稱	Scientific Reasoning and methods
學分數	3.0
必選修	必修
開課班級	四國際商務二甲 四國際金融二甲
任課教師	戴守煌
上課教室(時間)	週二第 5 節(W0403) 週二第 6 節(W0403) 週二第 7 節(W0403)
課程時數	3
實習時數	0
授課語言 1	英語
授課語言 2	
輔導考照 1	
輔導考照 2	
課程概述	<p>In your career, you will often come across the situation that you have to convince your colleague, your boss, your customers, or that other people try to convince you. How do you present solid argument to support your statement, or how do you discern whether other people offer valid argument to convince you? How do I know whether the information I receive from the mass media or the internet is correct? How do you apply these principles to construct and analyze your business models?</p> <p>This course aims to provide solutions to these questions by introducing the basic notions of logic and scientific methods. The goals include</p> <ol style="list-style-type: none"> 1.to equip the you with the power of reasoning, forming and discerning arguments, and critical thinking. 2.to learn the basic scientific methods, as a foundation to your further study and future career.
先修科目或預備能力	
課程學習目標與核心能力之對應	<p>※編號，中文課程學習目標，英文課程學習目標，對應系指標</p> <p>-----</p> <p>1.建立有關邏輯、推理與科學方法的基本知識。 ，Acquisition of the basic knowledge of logic, reasoning and scientific methods.，</p>

	<p>1 基本知能</p> <p>2.對來自媒體與網路的訊息建立獨立批判性思考的能力，並且產生自己的見解。 , Being able to think critically on the information from the mass media and internet.</p> <p>, 2 資訊能力</p> <p>3.將邏輯推理與科學方法的技能運用到未來的學業與職業生涯中。 , Application of logic reasoning and scientific methods to their future study and career.</p> <p>, 4 實務技能</p> <p>4.建立良好的論證能力，並且能夠察覺他人論證上的漏洞。 , Being able to present solid arguments, and to discern the fallacies in other people’ s arguments. , 7 表達溝通</p> <p>5.遇到生活中的難題，能透過邏輯與思考加以分析解決。 , Being able to analyze and solve the perplexing situations in the real life via logic and reasoning. , 9 人文與倫理素養</p> <p>6.與組員討論時能清楚表達個人看法，並對他人的意見給予回饋。 , Bring able to express oneself during discussion with group members, and to respond appropriately to others’ comments and opinions.</p> <p>, 7 表達溝通</p>
中文課程大綱	<p>A.科學思維</p> <p>1.基本邏輯概念</p> <p>2.論點的分析：論點的構成要素與型態</p> <p>3.論點的評估：歸納與演繹推理，謬誤</p> <p>4.邏輯推理解謎</p> <p>B.科學方法</p> <p>1.因果分析</p> <p>2.機率</p> <p>3.統計推理</p> <p>4.假設與科學推理</p>
英/日文課程大綱	<p>A.Scientific Reasoning</p> <p>1.Basic concept of logic</p> <p>2.Analyzing arguments: elements and types of arguments</p> <p>3.Evaluating arguments: inductive/deductive reasoning, and fallacies</p> <p>4.Puzzle analysis and solving</p> <p>B.Scientific Methods</p> <p>1.Causal reasoning</p> <p>2.Probability</p>

	<p>3.Statistical reasoning 4.Hypothesis and scientific reasoning</p>
<p>課程進度表</p>	<p>The tentative course schedule:</p> <p>Week# Topic</p> <p>Week 1 : Course Introduction</p> <p>Week 2 : What is Scientific Method?</p> <p>Week 3 : Academic Skills (1) – Taking Notes</p> <p>Week 4 : Academic Skills (2) – Reading Skills</p> <p>Week 5 : Logic (1) - Discerning facts from interpretation / reasoning from judgement</p> <p>Week 6 : Logic (2) - Recognizing arguments</p> <p>Week 7 : Logic (3) - Deduction and Induction</p> <p>Week 8 : Logic (4) - Evaluating Deductive arguments</p> <p>Week 9 : Mid-term Exam Week</p> <p>Week 10: Presentation 1 – Midterm assignment (Mind Maps of Professional Subjects)</p> <p>Week 11: Logic (5) - Evaluating Inductive arguments</p> <p>Week 12: Logic (6) - Decompose and Reconstruct Arguments</p> <p>Week 13: Logic (7): Fallacies</p> <p>Week 14: Critical Thinking</p> <p>Week 15: Probability and Statistical Reasoning</p> <p>Week 16: Presentation 2 – Term Project</p> <p>Week 17: Presentation 2 – Term Project</p> <p>Week 18: Final Exam Week</p> <p>The schedule will be subject to modification according to the actual progress of the course.</p>
<p>教學方式與評量方法</p>	<p>※課程學習目標，教學方式，評量方式</p> <p>-----</p> <p>建立有關邏輯、推理與科學方法的基本知識。</p> <p>，課堂講授分組討論實作演練啟發思考，口頭報告作業筆試</p> <p>對來自媒體與網路的訊息建立獨立批判性思考的能力，並且產生自己的見解。</p> <p>，實作演練啟發思考個案研究(PBL)分組討論，口頭報告自我評量筆試</p> <p>將邏輯推理與科學方法的技能運用到未來的學業與職業生涯中。</p> <p>，啟發思考分組討論實作演練個案研究(PBL)，口頭報告自我評量作業</p> <p>建立良好的論證能力，並且能夠察覺他人論證上的漏洞。</p> <p>，課堂講授分組討論實作演練啟發思考，口頭報告自我評量作業筆試</p> <p>遇到生活中的難題，能透過邏輯與思考加以分析解決。</p>

	<p>，課堂講授實作演練啟發思考分組討論，自我評量 與組員討論時能清楚表達個人看法，並對他人的意見給予回饋。 ，分組討論 實作演練，自我評量</p>
指定用書	<p>書名：A Workbook for Arguments: A Complete Course in Critical Thinking 作者：Morrow, David R./ Weston, Anthony 書局：Hackett Publishing Company, Inc 年份：2015 ISBN：9781624664274 版本：2 ed</p>
參考書籍	<p>1. "A Rulebook for Arguments," 4th ed. by Anthony Weston Hackett Publishing Company, Inc.(Nov 14, 2008) 2.“Asking the right questions : a guide to critical thinking,”11th ed. By M. Neil Browne, Stuart M. Keeley Longman (Jan 6, 2014) 3. "Truth, Knowledge, Or Just Plain Bull: How To Tell The Difference : A Handbook of Practical Logic and Clear Thinking" by Patten, Bernard M. Prometheus Books (Oct 1, 2004) 4. "Understanding Arguments: An Introduction to Informal Logic", 9th ed. By Walter Sinnott-Armstrong, Robert J. Fogelin 5.“Critical Reasoning: A Romp Through the Foothills of Logic,” by Oxford University” http://podcasts.ox.ac.uk/series/critical-reasoning-romp-through-foothills-logic 6.“Think Again: How to Reason and Argue” in Coursera, by Duke University: https://www.coursera.org/course/thinkagain 7.“A concise introduction to logic,” By P. A. Hurley Wadsworth Publishing</p>
教學軟體	
課程規範	<p>1. This is a group-activity oriented and active-learning oriented course. There are lots of group discussions, and the students are encouraged to learn and explore actively during the lecture,</p> <p>2. Assessment: Mid-term Exam 30% Mid-term Assignment 30% Term Project 40%</p>

