

# 國立台灣大學開授課程大綱

## 課程名稱:心理實驗法(中文課程大綱):

修課條件：修過普通心理學、統計學之大學部學生。

大學部學生必修。

上課方式：課堂講演與從事實驗並重。

除了一般的實驗法及設計入門之訓練外，本課程之特色是企圖把實驗心理學及相關重要發展串成脈絡架構，並輔以每個重要發展階段的範例實驗，期使心理實驗法課程內容不至於淪為零散的實驗拼湊，避免見樹不見林甚至迷失在樹海裡的現象，不管是實驗的設計進行或後續的資料分析，都企圖反映研究水準最近的發展。雖然在教學、實驗與資料分析上都會大量使用電腦，但教師已將其「使用者親和」化，學生並無須具備複雜電腦知識，只要花極短時間學會用電腦文書處理程式，即可勝任本課。雖非重點，但有興趣的學生也可以在本課裡額外學到設計複雜心理實驗電腦程式的入門技巧。各種反映最新發展的教材及摘要隨堂發放。上學期的教學強調傳統實驗法的內容，並由淺入深，慢慢帶領學生接觸電腦，至下學期則正式有系統讓學生了解電腦在現代實驗心理學裡扮演的角色。

教材內容：1. 實驗法的特點。混淆變項的處理。實驗設計簡介及入門。

2. 實驗心理學的演化鳥瞰。

3. 電腦的演變與使用中文電腦從事心理學實驗與資料分析之入門。  
以刺激洗牌（隨機程序）為例練習寫簡單的電腦程式（非必要）。

4. 心理物理學研究之介紹與範例實驗。（上學期）

絕對閾、差異閾的調整法與定值刺激法實作。

近代心理物理學：比率產生法實作。

高層認知的影響：信號偵測論實驗實作。

度量法濫觴：配對比較法則實驗與資料分析。（附電腦程式練習）

5. 感覺知覺研究之介紹。（上學期，時間不足時則縮簡）

6. 行為學派研究之介紹與範例實驗。

（下學期，視動物實驗室情況安排）

7. 資料理論：近代度量法簡介、範例實驗，與資料分析。（下學期）

Bell Lab 與 Thurstone Lab 在非計量取向上的近代發展。

相似性判斷實驗範例及與非計量多向度度量、類聚分析之配合。

8. 認知心理學研究趨勢之介紹與範例實驗。（下學期）

訊息處理取向與平行分散處理（類神經網路）取向的比較。

電腦化的認知心理學實驗範例之一：記憶掃描實驗。

電腦化的認知心理學實驗範例之二：Stroop 字色念名實驗。

電腦化的認知心理學實驗範例之三：中文字彙觸接實驗。

（註：電腦化的認知實驗範例預計安排三個，其內容或獨變項操弄及設計則可能會因應臨時需要或文獻的進展而有所改變）。

9. 配合電腦使用的趨勢，下學期逐漸引導學生瞭解電腦在實驗與資料分析裡所扮演的角色。並以授課教師實驗室開發之多目的中文心理實驗控制軟體協助學生實驗之進行。所有利用電腦進行的實驗都以全班同學為受試者，資料分析時也是讓每一個同學學習利用統計軟體分析全班資料。所提供範例實驗之規模與真正的研究幾無二致，同學們可在本課裡領略到「真實」的實驗之各項細節，而不僅是虛擬的或縮小型的「實驗展示」。

預期目的：1. 學生將瞭解一百五十年科學心理學之演進裡核心的觀念與風格之遞變，及最配合時代進展與本土需求的當代實驗心理學研究風貌。

2. 使學生具備較嚴謹從事實驗研究的能力，並能輕易遷移至其它領域的心理學或行為科學研究。具備入門的基礎並對當前心理學實驗研究之技術水準及細節有基本的認識，俾便於瞭解或批判課本或心理學研究者產生的知識。
3. 同學們可以利用到處存在的電腦或在自己的書房使用私人電腦進行實驗。本課因此將闡明要產生及發表一個夠水準的現代化心理學實驗並不必然需要「壯觀」的實驗室與「貴族化」的儀器。了解實驗法這些最近演變的知識，可以使學生帶著不同的視野飛向心理學或行為科學的各個領域，翱翔其間。心理實驗方法與心理計量技術是「專業」心理學家飛行的翅膀，向未知而充滿希望的世界飛行之前，不要忘了先要強固自己的翅膀。歡迎來強健您的翅膀！這是科學的心理學不可或缺的一門課。

成績評量：根據學生的考試與報告給分。

**課程名稱:心理實驗法上(英文課程大綱):**

**Course name: Methods of psychological experiments**

Lecturer: Jei-Tun Wu Email: jtwu@ntu.edu.tw Phone: 2363-5495 Psy Bld #307

### **Course Description:**

This is a two-semester course. Both lecture and experimentation will be equally emphasized. In the first three months, issues of how to make strict causal inference in behavioral science will be described in detail. And then, different domains of

methodological development, supplemented with example experiments, will be conceptually linked together to provide a thorough understanding of the history of experimental psychology. From the beginning of the second semester on, recently developing modern techniques and skills about computerized psychological experiments will be gradually introduced. At the last two months, replication studies of well established paradigms of cognitive experiment will be illustrated and be conducted by students. All the experiments assigned to be practiced are not just for demonstration but are as scale as real research experiments instead. This allows students to modify the default experimental design and easily manipulate the additional independent variables interested. There is no pre-requisite programming skills necessary for students to acquire the concept of doing computerized psychological experiments in this course.

### **Prerequisites:**

The students should have completed both courses of Introductory Psychology and Elementary Statistics, including topics of Introduction to Analysis of Variance, before taking this course.

### **Referenced Text:**

1. Liu, I.M. (1987). Basic Psychological Processes. (5<sup>th</sup> ed.) (in Chinese) Da Yang Publishing.
2. Kantowitz, B.H., & Roediger, H.L. (1978). Experimental Psychology: Understanding Psychological Research.
3. Massaro, D.W. (1989). Experimental Psychology: an information processing approach.
4. McBurney, D.H. (1990). Experimental Psychology. (2nd ed.)
5. Myers, A., & Hansen, C. (1997). Experimental Psychology. (4th ed.)
6. Manuals of any statistical software packages (SAS or SPSS).
7. Manuals of any programming language (optional).
8. Wu, J. T. (1995). A PC Software System of Lab Automation For Chinese Psychological Experiments. Chinese Journal of Psychology, 37, 1-24.
9. All supplementary materials, including source codes of computer programs designed by the lecturer, will be put on the course websites <http://jtwu.psy.ntu.edu.tw/> for students to be downloaded. A password is required to download the complete detail materials of the course.

### **Requirements**

Requirements include a mid-term exam, a final exam, and at least four term papers or experiment reports, for each semester. Attendance is mandatory. The grading system is

as follows: mid-term exam (25%) , final exam (25%), term papers and reports (50%).

### **Lecture/Discussion Topics**

1. Causal inference in behavioral science. (2 weeks)
2. Characteristics of conducting an experiment with related Issues. (2 weeks)
  - Ethics.
  - Practicing literature review with an electronic database.
3. Dealing with confounding variables. (1 weeks)
4. Introduction to experimental design. (6 weeks)
  - Between subjects design.
  - Within subjects design.
  - Analysis of variance in factorial design experiments.
5. History of experimental psychology. (1 week)
6. The role of computer in conducting a modern psychological experiment. (2 weeks)
7. Introduction to Psychophysics with example experiments. (4 weeks)
  - Webb's law.
  - Fechnerian function.
  - Stevens function.
  - Signal detection theory.
8. Introduction to Gestalt Psychology. (1 week)
9. Introduction to the research paradigm of Behaviorism. (1 week)
10. Introduction to Scaling methods with example experiments. (3 weeks)
  - Law of comparative judgment and Thurstonian scale.
  - Cluster analysis.
  - Multidimensional scaling.
11. Introduction to cognitive psychology with example experiments. (8 weeks)
  - Related issues regarding the measurement of reaction time.
  - Information processing approach vs. parallel distributed processing.
  - Replicating Sternberg's memory scanning experiment: A computerized study.
  - Elaborating the Stroop effect: A computerized study.
  - An experiment exploring mental rotation.
  - Example psycholinguistic experiments: Lexical decision and naming.

### **Goals Anticipated**

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The students are expected to be able to appreciate the concept about how to derive a strict causal inference in a behavioral research. In addition, they would have a general concept about the history and evolution of experimental psychology, and also be experienced with the state-of-the-art techniques and skills about how to perform modern computerized experiments and data analysis. Having learned this course,

which is also pre-requisite for an advanced graduate-level course of Experimental design, the students would be acquainted with basic knowledge regarding how to design a delicate experiment. Experimental design and Psychometrics are the two wings of well-trained researchers in psychology. After equipped with strong wings beforehand, an explorer can freely fly into the unknown world of psychology.

**Teaching Assistants**

To be announced.