管院碩士班(含碩專班)課程大綱
MS/MA Program Syllabus

2019.12.16 修訂

系所 Department	資管所 IM 醫管所 Medical IM	必選修 compulsory/elective	必修 Compulsory
課程名稱 Course title	Analysis and Application of Healthcare Data/醫療大數據分析與應用	學分數 Credit(s)	3
學年/學期 academic year/Semester	選擇一個項目。 114-1 學期 Fall semester 2025	上課地點 Classroom	管院 349
講授教師 Instructor	林育秀	上課時間 Time	Tuesday, 9:10AM~12:00

教師辦公室&諮詢時間 Instructor office number & office hour	管院 614 Monday	教師聯絡資訊 Instructor Contact	Phone: #34614 Email: yuhsiu@ccu.edu.tw
助教 Teaching assistant	TBA	助教 聯絡資訊 TA contact	Email: TBA

先修課程 Pre-requisite courses	N/A
課程目標 Course Objective	This course will introduce the National Health Insurance Research Database and health-related databases to students. Upon successfully completing this course, students will be able to "do something useful with SAS," including: to identify/characterize/define a problem, to design a program to solve the problem, to create executable code, and produce a course project.

AACSB 學習品質保證學習目標 Assurance of Learning (AOL) Learning goals

***請先選填為主要或次要學習目標(Major or minor learning goal)，再選擇對應之學習目標**

主要學習目標 Major learning goal	次要學習目標 Minor learning goal	次要學習目標 Minor learning goal
目標 1：知識整合 **LG1:Knowledge Integration**	**目標 3：研究能力** **LG3:Research Skills**	**目標 2：創造力與創新** **LG2:Creativity and Innovation**

教材 Teaching materials	1. Cody, R. (2018). Learning SAS® by example: a programmer's guide, 2nd Edition. SAS Institute. (ISBN-13: 978-1635266597). (You may use 1st Ed.) 2. Ardakani, S. P., & Cheshmehzangi, A. (2023). Big Data Analytics for Smart Transport and Healthcare Systems. Springer. (ISBN-13: 978-981-99-6619-6, eBook ISBN-13: 978-981-99-6620-2). 3. Iyigün, I., & Görçün, O. F. (2024). Health 4.0 and Medical Supply Chain. Springer. (ISBN-13: 978-981-99-1817-1, eBook ISBN-13: 978-981-99-1818-8). 4. Ong, J. C. L., Seng, B. J. J., Law, J. Z. F., Low, L. L., Kwa, A. L. H., Giacomini, K. M., Ting, D. S. W. (2023). Artificial intelligence, ChatGPT, and other large

<table>
<tr><td></td><td colspan="4">language models for social determinants of health: Current state and future directions. Cell Reports Medicine, 5, 101356.</td></tr>
<tr><td>網址 Course website</td><td colspan="4">E-course</td></tr>
<tr><td>教科書/參考書
Textbooks/Reference</td><td colspan="4">1. Cody, R. P. & Smith, J. K. (2006). Applied Statistics and the SAS Programming Language, Fifth Edition. Prentice-Hall, Inc. (ISBN13 9780131465329)
2. Rezaei, N. (2022). Trends of artificial intelligence and big data for e-health. Springer (ISBN: 978-3-031-111990, eBook available)
3. Kullkarni, A. J. et al. (2020). Big data analytics in healthcare. Springer. (ISBN: 978-3-030-31672-3, eBook available).
4. Tailor, K. (2016). The patient revolution: How big data and analytics are transforming the healthcare experience. Wiley & Sons, Inc. (ISBN: 9781119130178 (ePDF), eBook available).
5. Deepti Gupta (2018) Applied Analytics through Case Studies Using SAS and R. (ISBN 9781484235249) (e-BOOK available)
6. Nilmini Wickramasinghe (2017). Handbook of research on healthcare administration and management. AHISA. (e-BOOK available)
7. 汪海波(2015)。SAS 統計應用與分析：從入門到精通。上奇資訊。(ISBN: 978-986-375-204-2、Library: 512.4 8326-2)。
8. 李采娟(2016)。醫療應用統計學：SAS 操作與資料分析。雙葉書廊。(ISBN: 978-986-6018-70-1、Library: 512.4 8496)。
9. Levy, A., Goring S., Gatsonis, C., Sobolev, B., van Ginneken, E., Busse, R. (2019). Health Services Evaluation. (ISBN: 978193987153) (e-BOOK available)
10. Lowman, M. (2017). A practical guide to analytics for governments: using big data for good. (ISBN: 9781119362821) (e-BOOK available)</td></tr>
<tr><td rowspan="6">評量方式(請填百分比)
Assessment</td><td>課堂參與 Participation</td><td>10%</td><td>個案討論 Case study</td><td>%</td></tr>
<tr><td>作業 Homework</td><td>30%</td><td>專題 Project</td><td>30%</td></tr>
<tr><td>小考 Quiz</td><td>%</td><td>其他 1 other (　　)</td><td>%</td></tr>
<tr><td>期中考 Midterm</td><td>%</td><td>其他 2 other (　　)</td><td>%</td></tr>
<tr><td>期末考 Final</td><td>20%</td><td>其他 3 other (　　)</td><td>%</td></tr>
<tr><td>報告 Presentation</td><td>10%</td><td>其他 4 other (　　)</td><td>%</td></tr>
<tr><td>其他說明
Other description</td><td colspan="4">1. Academic Honesty: Academic integrity policy, based on the law: https://goo.gl/z6UqZ2 (Please read and understand). Most students are expected to be honest in your academic work, hence, you are expected to comply with the law. All research papers/assignments will be submitted through SafeAssignment to verify the originality of work and the adequacy of citation of sources.
2. Assignments are due on dates and at times note: Under normal circumstances, late work will NOT be accepted without prior agreement, except in the case of an emergency. You should contact me directly via e-mail if you have difficulty submitting an assignment on time. All assignments are due by close of business (COB) the day.
3. Student Disabilities: Please contact me personally at the beginning of the</td></tr>
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	semester if you have a condition or disability that may interfere with your performance in this course. We can discuss accommodations that may be necessary to allow you to participate fully and to facilitate your learning opportunities in the class.

課程規劃表 Course Schedule

週次 **week**	日期 **Date**	內容 **Description**	教材章節 **Textbook**	其他說明 **Remark**
1.	9/9	Introduction of National Health Insurance Database		
2.	9/16	1. Chap 1: What is SAS? 2. Chap 2: Writing your first SAS Program. 3. Chap 4: Creating permanent SAS data sets.		
3.	9/23	4. Chap 5: Creating formats and labels 5. Chap 6: Reading & Writing Excel spreadsheets. 6. Chap 14: Displaying your data		
4.	9/30	7. Chap 7: Performing conditional processing 8. Chap 9: Working with dates. 9. Chap 10: Subsetting & combining SAS data sets.	#1	**AR-1**
5.	10/7	10. Chap 11: Working with numeric functions. 11. Chap 12: Working with character functions. 12. Chap 16: Summarizing your data.	#1	**AR-2**
6.	10/14	13. Chap 17: Counting frequencies. 14. Chap 3: Reading raw data.		topic decided
7.	10/21	15. Chap 25: Macros 16. Chap 8: Performing conditional processing, looping. 17. Chap 13: Working with arrays.	#1	**AR-3**
8.	10/28	Macros in National Health Insurance Database 1		**Term paper Check point 1** **HW 1 due**
9.	11/4	Macros in National Health Insurance Database 2		
10.	11/11	**Midterm—Term paper group discussion**		**Term paper Check point 2**
11.	11/18	EG: Introduction SAS EG: Case study 1: Lung cancer 1		**AR-4**
12.	11/25	SAS EG: Case study 1: Lung cancer 2		
13.	12/2	**Guest lecture** **Speaker: TBD** **Topic:**		**Term paper due** **HW 2 due**
14.	12/9	Term paper presentation 1		

15.	12/16	Term paper presentation 2		
16.	12/23	**Final exam**		
17.	12/30	Self-learning 以類流感與流感就診人次為例		
18.	1/6	Self-learning 巴氏量表問卷分析		

Assigned Reading: #2, #3, #4

Book 2

(1) Ch 6-Healthcare Infrastructure Development and Pandemic Prevention: An Optimal Model for Healthcare Investment Using Big Data

(2) Ch 7-Big Data for Social Media Analysis During the COVID-19 Pandemic: An Emotion Analysis Based on Influences from Social Networks

(3) Ch 8-Big Data-Enabled Time Series Analysis for Climate Change Analysis in Brazil: An Artificial Neural Network Machine Learning Model

(4) Ch 9-Optimized Clustering Model for Healthcare Sentiments on Twitter: A Big Data Analysis Approach

Book 3

(1) Ch 9-Health 4.0

(2) Ch 10-Healthcare 4.0 and Decision-Making Techniques in the Health Industry: A Systematic Literature Review

Paper

(1) Ong, J. C. L., Seng, B. J. J., Law, J. Z. F., Low, L. L., Kwa, A. L. H., Giacomini, K. M., Ting, D. S. W. (2023). Artificial intelligence, ChatGPT, and other large language models for social determinants of health: Current state and future directions. *Cell Reports Medicine, 5*, 101356.

Class Participation

Classroom attendance is a necessary part of this course. You are allowed no more than 6 of unexcused absences. However, each absence will reduce one point on class participation. Classroom participation is a part of your grade in this course. To participate you must attend class having prepared the materials for the day. Questions and comments must be relevant to the topic at hand. Each comment for each week will be counted one point.

Each student will be assigned at one chapter of the second course material for leading reading. You may arrange which part of presentation by yourselves. The leading reading will be counted for part of class

participation **(10%)**.

Term Paper (30%--10% for oral presentation, 20% for paper)

The term paper will be based on group work, and each group will be 1-3 people. You must apply NHIRD as your data source. Students are required to complete one 3,500-5,000 words research paper **IN ENGLISH** on the topic of their choice and to submit their research paper in the **1st, December** and due by **close of business (COB, 5pm)** the day.

Paper structure

1. **Title page** – include the title of your paper, your name, the course name, name of the instructor and date. The title must be succinct and limited to 75 characters.
2. An **abstract** of 200-350 words.
3. **Main Text**. The text of the article is limited to **3,500-5,000 words with 1.5 spaced pages in word format Times New Roman**, **NOT** including the cover page, abstract, and reference pages (or abstract and table of contents which are not required - but if used). Charts, graphs, photos, drawings, lists and extended quotes will **NOT** count against the written text required.
   (1) **Introduction/Background**: State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.
   (2) **Methods**: Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.
   (3) **Results**: Results should be clear and concise.
   (4) **Discussion/conclusion**: This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Limitations and suggestions may also list this section.
4. **References.** The APA 7 standard will be used. A **minimum of 15 references must be used**. Your references should consist primarily of peer-reviewed journal articles. References can include material from the Internet if from a reputable source. Wikipedia is **not** a reputable source. Reputable sources include government agencies and professional organizations, for data and policy statements. Citations should be

presented in APA 7 format. The Word "footnote" function can be used to accomplish this if you do not have EndNote.

5. Tables/graphs should immediately follow the references.
6. **SAS programming**. You may provide the entire SAS programming (SAS codes), and the raw datasets. All SAS programming will be expected to reproduce your results.
7. **Teamwork sheet**. Please to identify your responsibilities in your term paper. Each one should be assigned at least one work, but not summarized or oral presentation.
8. **Declaration of generative AI in academic writing.** You must disclose the use of generative AI and AI-assisted technologies in the writing process by adding a statement. Also, you need to provide the transcripts as the attachment.

Check point:

(1) The 1st check point is to develop a 2-3 page proposal on your proposed research topic. This proposal should include a short background of the literature, your research question(s)/hypothesis, and a description of your proposed data sources.

(2) Your 2nd check point builds upon your first check point. In your 2nd check point, you will add a methods section and initial map (i.e., preliminary results) to your proposal. This section of your proposal should be between 3-5 pages.

(3) Your final term paper will "bring it all together" in a final report, in a report suitable for peer-reviewed publication (i.e., formatted with references, title page, etc.). A word of advice – start keeping track of your references early ☺

Oral presentation

You will present your papers and share ideas in class. Presentations are to be in PowerPoint (not PDF), with effective use of margins, white space, and templates that are professional and easy to read. Insert page numbers on all assignments. Each group will have sufficient time to present their own work, and the length will be 50-70 minutes. Every student should present at least 5 minutes in English. Other groups should point out at least one question for the topic. You may grade others work inter- and intra-group. Please do your best.

Examinations

Final examinations will be an taking home exam due by **Dec. 24**. Students should **NOT** discuss the exams or work in groups.

Self-learning: SAS Official Online Course Resources

For this semester, you need to take some SAS official online courses (https://reurl.cc/14o0kQ) for self-learning. Please do it step by step. Once you finished it, you may submit your SAS program to eCourse 2.

1. 以類流感與流感就診人次為例 **(Due by Dec. 31)**
2. 巴氏量表問卷分析 **(Due by Jan. 7)**

Use of Cell phones and Laptop Computers in Class

Cell phones are to be turned off and put away during class unless otherwise instructed. Laptops are allowed in class for performing in-class work, **BUT NOT ALLOWED to do other works during class**. I know you would not disrespect your colleagues by doing personal activities on your laptop while in class. If I find this is not the case, students will be required to put laptops away during class.