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 5307147 醫管所 Medical IM 5555075	必選修 compulsory/elective	選修 Elective
課程名稱 Course title	醫療資料探勘實作 Data Mining Applications in Healthcare	學分數 Credit(s)	3
學年/學期 academic year/Semester	113-2 學期 Spring semester 2025	上課地點 Classroom	管院 349
講授教師 Instructor	林育秀 Yu-Hsiu Lin	上課時間 Time	Tuesdays, 9:10AM~12:00
教師辦公室&諮詢時間 Instructor office number & office hour	614 Tuesdays	教師聯絡資訊 Instructor Contact	Phone: 34614 Email: yuhsiu@ccu.edu.tw
助教 Teaching assistant	TBD	助教 聯絡資訊 TA contact	Email:

先修課程 Pre-requisite courses	Analysis and Application of Healthcare Data OR base SAS skill
課程目標 Course Objective	This course is an introduction to the SAS EG and EM for students. Moreover, 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 5：商業倫理 **LG5:Business Ethics**

教材 Teaching materials	Handouts
網址 Course website	E-course2
教科書/參考書 Textbooks/Reference	1. Sarma, K. S. (2017). Predictive modeling with SAS Enterprise Miner: practical solutions or business applications (3rd edition). NC: SAS Institute Inc. (ISBN: 978-1-63526-040-3 (PDF)) 2. Faries, D., Zhang, X., Kadziola, Z., Siebert U., Kuehne, F., Kuehne, F., Obenchain, R. L., Haro, J. M. (2020). Real world health care data analysis: causal methods and implementation using SAS. NC: SAS Institute Inc. (ISBN: 978-1-64295-799-

<table>
<tr><td></td><td colspan="4">0 (PDF))
3. Nisbet, R., Miner, G., Yale, K. (2018). Handbook of statistical analysis and data mining applications. DOI: https://doi.org/10.1016/C2012-0-06451-4. (ISBN: 978-0-12-416632-5) (e-Book available)
4. Ron Cody (2018). Learning SAS® by example: a programmer's guide, Second Edition. SAS Institute. (ISBN-13: 978-1635266597)
5. Wahi, M. M. & Seebach, P. (2017). Analyzing health data in R for SAS users. Chapman & Hall. (ISBN：9781498795883)
6. Tailor, K. (2016). The patient revolution: How big data and analytics are transforming the healthcare experience. Wiley & Sons, Inc. (ISBN: 9781119130178 (ePDF), eBook available).Cody, R. P. & Smith, J. K. (2006). Applied Statistics and the SAS Programming Language, Fifth Edition. Prentice-Hall, Inc. (ISBN13 9780131465329)
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)。</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>30%</td><td>個案討論 Case study</td><td>20%</td></tr>
<tr><td>作業 Homework</td><td>%</td><td>專題 Project</td><td>20%</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>30%</td><td>其他 3 other ( )</td><td>%</td></tr>
<tr><td>報告 Presentation</td><td>%</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 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.</td></tr>
</table>

課程規劃表 Course Schedule

週次 **week**	日期 **Date**	內容 **Description**	教材章節 **Textbook**
1.	2/18	Introduction of National Health Insurance Database and application	
2.	2/25	**Section 1- Apply in NHIRD: SAS Enterprise Guide** 1. Background introduction, preparing inpatient dataset and outpatient dataset	
3.	3/4	2. Preparing causes of death dataset 3. Data analysis and Combine reports	
4.	3/11	**Section 2- Customer Analysis** 1. Import data and Customers' information, Customers' behavior, and Consuming items	
5.	3/18	1. Data Validation-analyze and check each variable	
6.	3/25	2. Data Validation-analyze and check for two variables, and self-practice	Case study 1
7.	4/1	**Section 3- Predictive Customer behaviors** 1. Introduction of SAS EM, data mining, dealing with missing value	Case study 2
8.	4/8	**Break**	
9.	4/15	***Workshop 1**	
10.	4/22	2. Separated sampling, transformations 3. Machine learning 1-logistic regression	Case study 3
11.	4/29	4. Machine learning 2-Decision tree 5. Machine learning 3-ANN	Case study 4
12.	5/6	6. Model comparison Introduction to Predictive Modeling: Regressions	Case study 5
13.	5/13	Introduction to Predictive Modeling: Neural Networks and Other Modeling Tools	Case study 6
14.	5/20	Model Assessment Model Implementation	
15.	5/27	**Competition:** 肺炎病人死亡風險預測 Predictive models of mortality risk in pneumonia patients 2	

16.	6/3	***Workshop 2**	
17.	6/10	***Workshop 3**	
18.	6/17	***Workshop 4**	

***Note: Workshop will be hold on 4/26 and 4/27, and the guest lecturer will use Mandarin instead of English. Please make sure you can participate it and available in Mandarin.**

Case study: Gupta D. (2018). Applied analytics through case studies using SAS and R. Apress Media LLC: Welmoed Spahr. ISBN-13: 978-1-482-3524-9 (eBook available).

Case study 1: Banking case study [Logistic regression model]
Case study 2: Retail case study [Time series model]
Case study 3: Telecommunication case study [Decision tree model]
Case study 4: Healthcare case study [Random forest model]
Case study 5: Airline case study [Multiple linear regression model]
Case study 6: FMCG case study [RFM Model and K-means clustering]

SAS self-e-learning (Link: https://reurl.cc/2zN6jn)

A. EM 捐血意願預測
1. 資料處理與決策樹
2. 迴歸與類神經模型與模型評估

B. EM 波士頓房價預測
1. 資料處理與決策樹
2. 模型比較與評分