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| **ESM3081 Programming for Data Science (Spring 2025)** Department of Systems Management Engineering, Sungkyunkwan University |

**1. Overview**

Data science has become an important part of various industrial fields, such as manufacturing, marketing and finance. This course aims to provide a broad introduction to programming for data science. Students will learn and practice how to implement data science techniques with Python, including data preprocessing, supervised learning, unsupervised learning, and model selection and evaluation.

\* *Prerequisites*: Python, Linear Algebra, Applied Statistics II, and Data Mining  
\*\* **You must have taken the prerequisite courses (or equivalent) before taking this course.**

**2. General Information**

- Class Time: Friday, 12:00-14:45  
- Location: ~~23217~~ 🡪 **26421** (Engineering Building 2)  
- Language: Korean  
- Course Webpage: <https://sites.google.com/view/skkudm/courses>  
- Q&A: use the Q&A Board on icampus (문의게시판)

**3. Instructor**

- Prof. Seokho Kang  
- Office: 27408B (Engineering Building 2)  
- E-mail: s.kang at skku.edu  
- Office Hours: by appointment

**4. Teaching Assistants (TA)**

- Ms. Jinju Park  
- Office: 27407 – Data Mining Lab. (Engineering Building 2)  
- E-mail: apfhsk777 at naver.com

**5. References**

- Andreas C. Müller & Sarah Guido, ***Introduction to Machine Learning with Python: A Guide for Data Scientists***, O'Reilly Media, 2016.  
- Aurélien Géron, ***Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems***, O'Reilly Media, 2019.  
- ***scikit-learn: Machine Learning in Python***, <https://scikit-learn.org/>

**6. Evaluation**

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| **Attendance**1 | **Assignments**2 | **Midterm Exam**3 | **Final Exam**3 | **Total**4 |
| 10% | 20% | 30% | 40% | 100 + α |

1 More than six “unexcused” absences will result in an F grade.  
2 Assignments should be submitted to icampus by midnight on the due date. Late submissions will NOT be accepted.  
3 Exams are closed-book and closed-note. **NO make-up exams.**  
4 Final grades will be assigned based on overall class performance.

*\* α – participation (extra points)*

**7. Schedule (tentative, subject to change)**

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| **Week** | **Date** | **Lecture Topics** | **Assignments** |
| 1 | 3/7 | Course Introduction | A1 (due on 3/21) |
| 2 | 3/14 (Online) | Supervised Learning |  |
| 3 | 3/21 | Supervised Learning |  |
| 4 | 3/28 | Supervised Learning | A2 (due on 4/11) |
| 5 | 4/4 | Supervised Learning |  |
| 6 | 4/11 | Supervised Learning |  |
| 7 | 4/18 | Supervised Learning | A3 (due on 5/2) |
| **8** | **4/25** | **Mid-Term Exam** |  |
| 9 | 5/2 | Unsupervised Learning |  |
| 10 | 5/9 | Unsupervised Learning | A4 (due on 5/23) |
| 11 | 5/16 | Representing Data and Engineering Features |  |
| 12 | 5/23 | Model Evaluation and Improvement |  |
| 13 | 5/30 | Algorithm Chains and Pipelines & ML Project Checklist | A5 (due on 6/13) |
| 14 | 6/6 (Online) | Anomaly Detection |  |
| **15** | **6/13** | **Final Exam** |  |

**8. Academic Integrity**

Students are responsible for maintaining high standards of academic integrity in all of their class activities. Cheating or plagiarism in any form will not be tolerated. Any violation of academic integrity is a serious offense and is therefore subject to an appropriate sanction or penalty.