

# Syllabus: Artificial Intelligence

Spring 2022

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Lecture Note: <http://lms.mju.ac.kr>

# Course Introduction

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- Course Title: 인공지능(Artificial Intelligence)
  - 데이터테크놀로지 전공 **3학년 전공 필수** 교과목, 이론 3학점 (실습 포함)
  - 강의내용: 데이터에 focus를 둔 머신러닝, Python/Jupyter notebook/Octave 등 활용 실습
  - 선수지식
    - 파이썬 등 기본적인 프로그래밍과 설계에 대한 이해
    - 선형 대수 및 통계에 대한 이해
    - 데이터에 대한 이해 및 활용 능력
- 교수: 전종훈 (인문캠퍼스 본관 1306호)
  - 전화: 02-300-0647
  - 상담시간: 화요일 15:00~16:00 / 상담예약
  - 이메일: [jchun@mju.ac.kr](mailto:jchun@mju.ac.kr)
- Lecture Note
  - <https://lms.mju.ac.kr> (많은 부분이 **영어**로 되어 있음!)

# Course Introduction (계속)

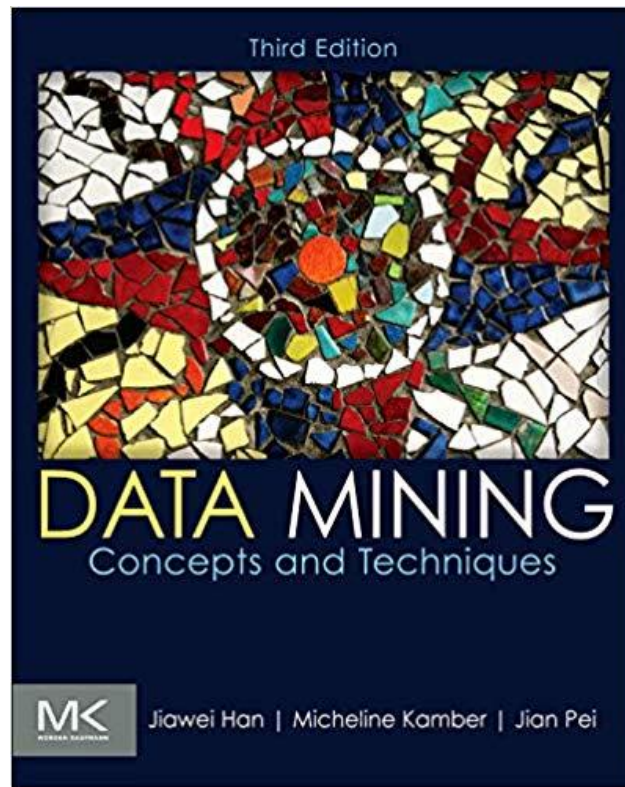
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- 수업운영 방식
  - 비대면 동영상 강의 LMS(lms.mju.ac.kr) + 과제 (~ 3/31)
  - (동영상 강의) 퀴즈 및 개인 과제
  - 실시간 비대면 (zoom) 강의
  - 3월 이후 강의 방식은 방역수칙에 의한 학교 방침에 따름
- 강의 동영상/강의관련 자료/과제 제출\*
  - 대학 LMS 사이트: <http://lms.mju.ac.kr>
- 조교: 박세희
  - 인문캠퍼스 본관 11045호
  - 이메일: [hee00315@gmail.com](mailto:hee00315@gmail.com)
  - 조교 상담시간 및 장소: TBA

\*파일 사이즈 이슈로 인해 조교 이메일로 과제를 제출할 수 있음

# Text Book

- **“Data Mining: Concepts and Techniques,”**
  - J. Han, M. Kimber, and J. Pei, Morgan Kaufmann Publishers, 3<sup>rd</sup> Edition 2012.
- **“Introduction to Data Mining,”**
  - P. Tan, M. Steinbach, A. Karpatne, and V. Kumar, Pearson/Addison Wesley, 2<sup>nd</sup> Edition 2018.
- **“파이썬을 이용한 머신러닝, 딥러닝 실전 개발 입문,”**
  - 쿠지라 히코우즈쿠에 저/ 윤인성 역 위키북스, 2017.



# Grading Policy

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- 출석 10%
  - 5회 이상 무단으로 동영상 강의 수강하지 않거나 결석할 시 F
  - 무단결석 1회 감점 1점, 부득이한 경우 반드시 사전에 문서로 제출
- 시험(총2회) \* 60%
  - 중간고사 4/21(목) 18시 예정 30%
  - 학기말시험 6/14(화) 18시 확정 30%
- 과제 20%
  - Copy나 표절 발각 시 관련자 모두 마이너스 점수 처리
  - 필기·구현과제 (실습이나 구현 과제 관련하여 변경사항 있을 시 추후공고)
- 퀴즈 10%
  - (동영상) 강의 중 불시에 퀴즈가 예정되어 있으며, 제출 일시를 반드시 지켜야 함.
  - 제출 일시를 지키지 않을 경우 0점 처리
- 전체 점수로 100점 만점에 60점 미만 F
  - 기타 학점비율은 학사규정에 따르며, 어떠한 예외도 없음

\*집합 대면 형태의 중간 및 학기말 고사를 치르는 것을 원칙으로 하나, 시험 형식은 코로나 상황에 따라 변경될 수 있음

# Topics to be covered (tentative)

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- 강좌소개/Python Review
- 데이터 수집 및 전처리/시각화 (짧게)
- 텍스트 마이닝
- Bayesian Classification
- Decision Tree
- Ensemble Methods
- Random Forest
- Linear/Logistic Regression
- Support Vector Machines
- K-Means Clustering
- Principal Component Analysis
- Association Rule Mining
- Anomaly Detection
- Python
- Jupyter Notebook
- Octave
- PyTorch

What?

# Terminology

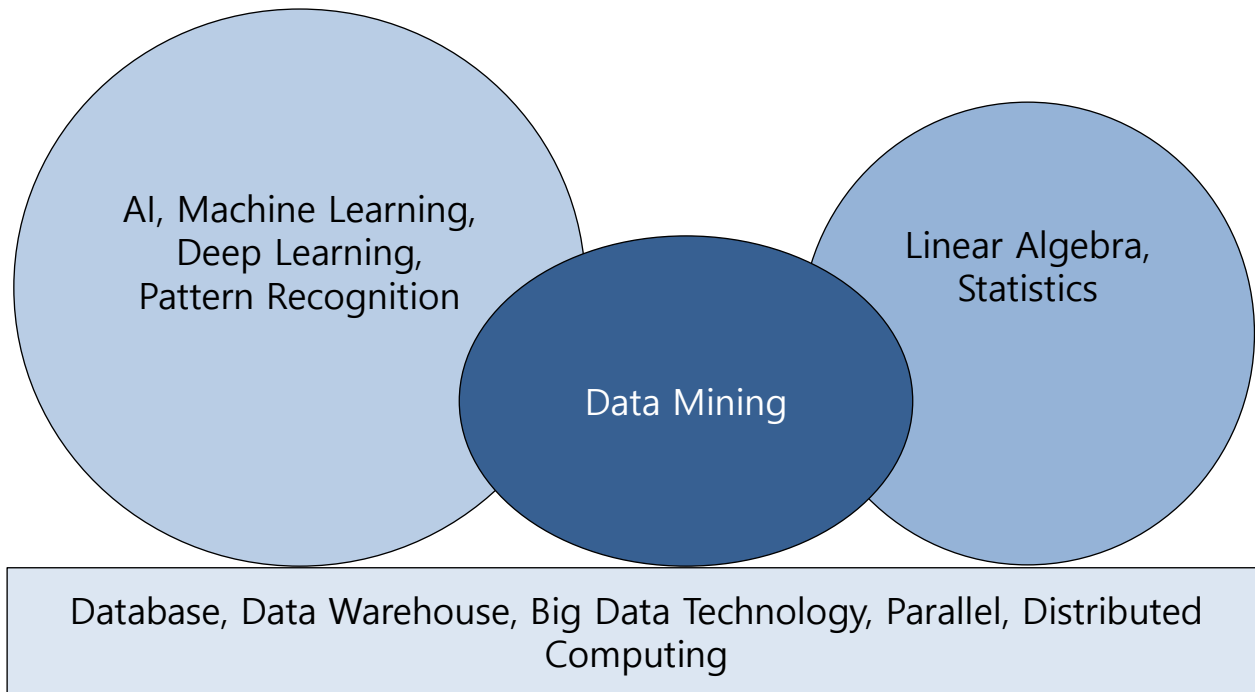
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- AI
- Machine Learning
- Deep Learning
- Pattern Recognition
- DB vs. DW(Data Warehouse)
- Data Mining
- ... Linear Algebra & Statistics ...

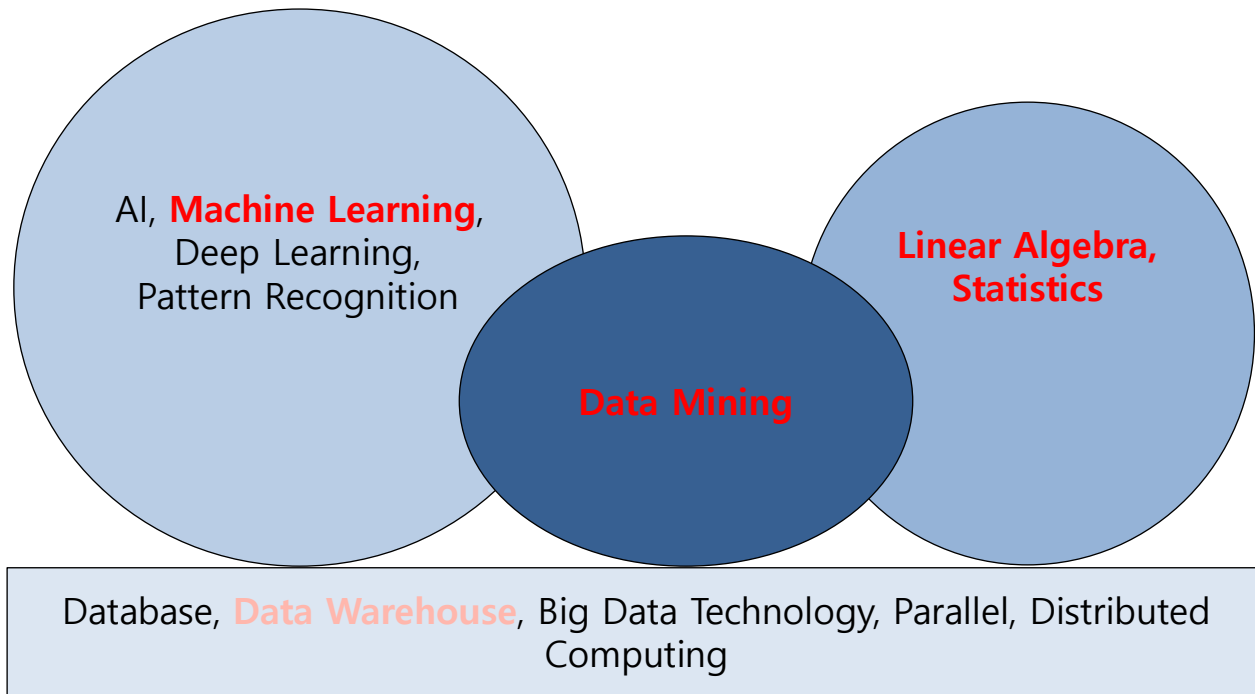


# 도대체 무엇을 얼마나 알아야...

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# 이것들만 조금이라도 알아야...



**But why?**

# 최고의 직업은 데이터 사이언티스트!

출처: <https://www.forbes.com/sites/louiscolumnbus/2018/01/29/data-scientist-is-the-best-job-in-america-according-glassdoors-2018-rankings/#76f24355357>

38,425 views | Jan 29, 2018, 02:47pm

## Data Scientist Is the Best Job In America According Glassdoor's 2018 Rankings



Louis Columbus Contributor

### TWEET THIS

Data Scientist has been named the best job in America for three years running, with a median base salary of \$110,000 and 4,524 job openings.

DevOps Engineer is the second-best job in America, with a median base salary of \$105,000 and 3,369 job openings.

가장 각광받는  
일자리  
50개 중 19개  
가 IT 관련  
직종

Ranking	Job	Median Base Salary	Job Score (5.0 scale)	Job Satisfaction (5.0 scale)	Job Openings
1	Data Scientist	\$ 110,000	4.8	4.2	4,524
2	DevOps Engineer	\$ 105,000	4.6	4	3,369
3	Marketing Manager	\$ 85,000	4.6	4	6,436
4	Occupational Therapist	\$ 74,000	4.5	4	11,903
5	HR Manager	\$ 85,000	4.5	3.9	4,458
6	Electrical Engineer	\$ 76,000	4.5	3.9	5,839
7	Strategy Manager	\$ 135,000	4.5	4.2	1,195
8	Mobile Developer	\$ 90,000	4.5	4.1	1,809
9	Product Manager	\$ 113,000	4.4	3.7	7,531
10	Manufacturing Engineer	\$ 72,000	4.4	4	4,241
11	Compliance Manager	\$ 96,000	4.4	4.3	1,222
12	Finance Manager	\$ 116,000	4.4	3.8	2,998
13	Risk Manager	\$ 97,000	4.4	4.2	1,209
14	Business Development Manager	\$ 75,000	4.4	3.9	4,060
15	Front End Engineer	\$ 100,000	4.4	4.2	1,222
16	Site Reliability Engineer	\$ 120,000	4.4	4.1	1,064
17	Mechanical Engineer	\$ 75,000	4.4	3.8	5,079
18	Analytics Manager	\$ 115,000	4.4	3.9	1,381
19	Tax Manager	\$ 110,000	4.4	3.7	3,309
20	Creative Manager	\$ 110,000	4.3	4.3	824
21	Software Engineer	\$ 102,500	4.3	3.6	29,187
22	Hardware Engineer	\$ 115,000	4.3	4.2	806
23	Corporate Recruiter	\$ 65,000	4.3	4.3	2,330
24	QA Manager	\$ 92,000	4.3	3.8	1,741
25	Physician Assistant	\$ 104,000	4.3	3.6	5,517
26	Database Administrator	\$ 94,000	4.3	3.8	2,370
27	UX Designer	\$ 90,000	4.3	3.8	1,963
28	Nursing Manager	\$ 84,660	4.3	3.7	4,209
29	Engagement Manager	\$ 115,000	4.3	3.7	2,169
30	Solutions Architect	\$ 125,000	4.2	3.6	3,325
31	Process Engineer	\$ 78,000	4.2	3.8	3,033
32	Reliability Engineer	\$ 92,000	4.2	4.3	747
33	Data Engineer	\$ 100,000	4.2	3.7	2,816
34	Operations Manager	\$ 65,000	4.2	3.8	13,706
35	Speech Language Pathologist	\$ 72,000	4.2	3.7	11,573
36	Communications Manager	\$ 80,000	4.2	3.9	1,380
37	Audit Manager	\$ 100,000	4.2	3.7	1,951
38	Data Analyst	\$ 60,000	4.2	3.9	4,729
39	Systems Analyst	\$ 75,000	4.2	3.7	2,710
40	Facilities Manager	\$ 75,000	4.2	3.8	2,139
41	Strategic Account Manager	\$ 85,000	4.2	4.1	808
42	Business Intelligence Developer	\$ 86,000	4.1	3.9	882
43	Business Analyst	\$ 71,000	4.1	3.6	9,603
44	Accounting Manager	\$ 82,000	4.1	3.6	3,273
45	UI Developer	\$ 95,000	4.1	3.8	1,004
46	Executive Assistant	\$ 55,000	4.1	3.9	4,684
47	Management Consultant	\$ 110,000	4.1	3.8	1,024
48	Project Manager	\$ 80,000	4.1	3.5	23,274
49	Nurse Practitioner	\$ 100,000	4.1	3.5	8,510
50	HR Generalist	\$ 57,210	4.1	3.9	2,705

# 2022년은?

출처: [https://www.glassdoor.com/List/Best-Jobs-in-America-LST\\_KQ0,20.htm](https://www.glassdoor.com/List/Best-Jobs-in-America-LST_KQ0,20.htm)

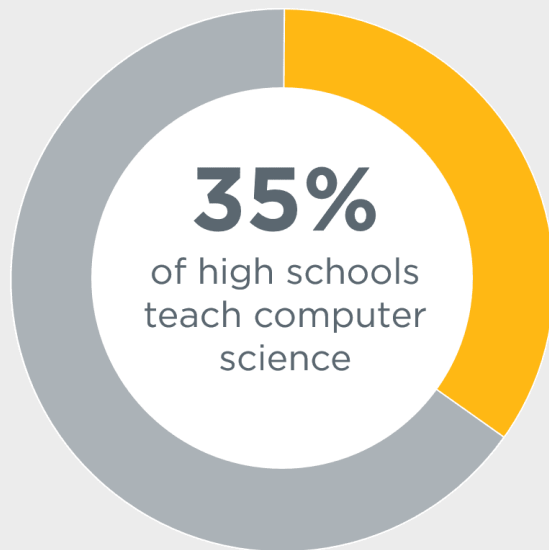
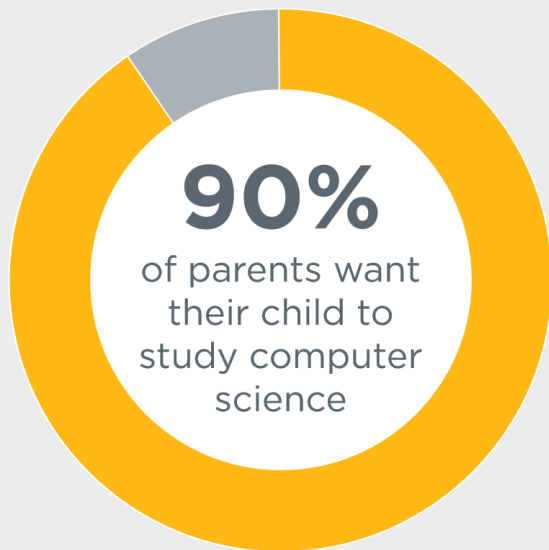
Best Jobs	2022	United States	Share	<a href="#">f</a> <a href="#">t</a> <a href="#">in</a> <a href="#">v</a>
Job Title	Median Base Salary	Job Satisfaction	Job Openings	
#1 Enterprise Architect	\$144,997	4.1/5	14,021	<a href="#">View Jobs</a>
#2 Full Stack Engineer	\$101,794	4.3/5	11,252	<a href="#">View Jobs</a>
#3 Data Scientist	\$120,000	4.1/5	10,071	<a href="#">View Jobs</a>
#4 Devops Engineer	\$120,095	4.2/5	8,548	<a href="#">View Jobs</a>
#5 Strategy Manager	\$140,000	4.2/5	6,977	<a href="#">View Jobs</a>
#6 Machine Learning Engineer	\$130,489	4.3/5	6,801	<a href="#">View Jobs</a>
#7 Data Engineer	\$113,960	4.0/5	11,821	<a href="#">View Jobs</a>
#8 Software Engineer	\$116,638	3.9/5	64,155	<a href="#">View Jobs</a>
#9 Java Developer	\$107,099	4.1/5	10,201	<a href="#">View Jobs</a>
#10 Product Manager	\$125,317	4.0/5	17,725	<a href="#">View Jobs</a>
#11 Back End Engineer	\$112,384	4.2/5	6,221	<a href="#">View Jobs</a>
#12 Cloud Engineer	\$118,999	4.0/5	10,689	<a href="#">View Jobs</a>
#13 HR Manager	\$91,502	4.3/5	7,276	<a href="#">View Jobs</a>
#14 Business Development Manager	\$89,496	4.2/5	9,263	<a href="#">View Jobs</a>
#15 Information Security Engineer	\$116,919	4.1/5	7,264	<a href="#">View Jobs</a>

출처: <https://www.forbes.com/sites/jairhilburn/2022/02/02/the-50-best-jobs-in-america-for-2022-according-to-glassdoor/?sh=7502d819faee>

			Page 1 of 3
Jobs	Job Satisfaction	Number of Job Openings	Median Base Salary
Enterprise Architect	4	14,021	\$144,997
Full Stack Engineer	4	11,252	\$101,794
Data Scientist	4	10,071	\$120,000
Devops Engineer	4	8,548	\$120,095
Strategy Manager	4	6,977	\$140,000
Machine Learning Engineer	4	6,801	\$130,489
Data Engineer	4	11,821	\$113,960
Software Engineer	4	64,155	\$116,638
Java Developer	4	10,201	\$107,099
Product Manager	4	17,725	\$125,317
Back End Engineer	4	6,221	\$112,384
Cloud Engineer	4	10,689	\$118,999
Hr Manager	4	7,276	\$91,502
Business Development Manager	4	9,263	\$89,496
Information Security Engineer	4	7,264	\$116,919

# 컴퓨터 배웁시다!

## The majority of schools don't teach computer science



# 컴퓨터 배웁시다!

## The value of a computer science education

**\$0.58M**  
lifetime earnings of a  
high school graduate\*



**\$1.19M**  
lifetime earnings of a  
college graduate\*



**\$1.67M**  
lifetime earnings of a  
computer science major\*



A computer  
science major  
can earn  
**40% more**  
than the  
college  
average.

\*Net present value today

# 컴퓨터 기왕이면 자~알~ 배우시다!

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“In the U.S. alone, there are nearly 571,000 open computing jobs with less than 50,000 computer science graduates entering the workforce – that’s roughly 11 job postings for every computer science major! ”



END