

<2022 년 2 학기 논문제출자격시험 시험제출범위>

Part 1: Computing and Programming

	세부 주제 (Topic)	참고 자료 (Material)
Part 1	Python programming basics	PP Ch. 2-11, Video 1-6
Part 2	Recursion, Search and Sorting algorithms	CLRS Ch 7~8 PP Ch. 13, Video 7, Video 8
Part 3	Linked lists	CLRS Ch 10, Video 9-1, 9-2
Part 4	Binary Search Trees	CLRS Ch 12, Video 10
Part 5	Trees and Graphs	CLRS Ch 10, Ch 20, Video 11, Video 12
Part 6	Hash	CLRS Ch 11, Video 13
Part 7	Bits, Data types, and Operations	ICS Ch. 2, Video 15
Part 8	Von Neumann model and Machines code	ICS Ch. 4, Video 17
Part 9	C programming basics	C, ICS Ch. 11-16, Video 19-22
Part 10	I/O in C	C, ICS Ch. 18, Video 23,
Part 11	Dynamic data structures in C	C, ICS Ch. 19, Video 24
Part 12	Algorithm basics	CLRS Ch. 1- 4
비고 (참고 자료)	PP: Practical Programming: An introduction to Computer Science using Python 3.6, P. Gries, J. Campbell, and J. Montojo (Available for free)	
	ICS: Introduction to Computing Systems: from bits & gates to C/C++ & beyond, Y. N. Patt and S. J. Patel	
	CLRS: Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Ribest, and Clifford Stein, 4th edition.	
	C: Book on C, A: Programming in C, 4th Edition, Al Kelley and Ira Pohl	
	Video: 2021-2 학기 컴퓨팅기초 강의영상 영상링크	
	컴퓨팅 기초 수업 2022-1 학기 수업: eTL 복습을 위한 청강 신청 가능 데이터사어언스를 위한 소프트웨어 플랫폼 2021-1 학기 수업: eTL 복습을 위한 청강 신청 가능	

Part 2: Math and Statistics

	세부 주제 (Topic)	참고 자료 (Material)
Part 1	Linear Algebra	MML Ch2.1-2.7
Part 2	Analytical Geometry	MML Ch3.1-3.6, 3.8
Part 3	Matrix Decompositions	MML Ch4.1-4.5
Part 4	Vector Calculus	MML Ch5.1-5.6
Part 5	Probability	AS Ch1
Part 6	Random Variables	AS Ch2
Part 7	Expectation , Variance and Covariance	AS Ch3
Part 8	Convergence, Law of Large Number, Central Limit Theorem	AS Ch5
Part 9	Statistical Inference, Bias, Mean Squared Error	AS Ch6
Part 10	Cumulative Distribution Function and Bootstrap	AS Ch7-8
Part 11	Parametric Inference, Likelihood, Maximum Likelihood Estimation	AS Ch9
Part 12	Hypothesis test, P-value, Multiple test correction	AS Ch10
Part 13	Bayesian Inference	AS Ch11
비고 (참고 자료)	MML: Mathematics for machine learning,	
	AS: All of Statistics, Larry Wasserman	
	수학과 통계의 기초 2022-1 학기 수업: eTL 복습을 위한 청강 신청 가능	

Part 3: Machine Learning and Deep Learning

	세부 주제 (Topic)	참고 자료 (Material)
Part 1	Linear Regression	ISL Ch.3.1-3.2
Part 2	Classification: Logistic Regression	ISL Ch.4.1-4.3
Part 3	Classification: Generative Models for Classification	ISL Ch.4.4
Part 4	Resampling Methods: Cross-Validation, Bootstrap	ISL Ch.5.1-5.2
Part 5	Model Selection: Subset Selection	ISL Ch.6.1
Part 6	Model Selection: Shrinkage Methods	ISL Ch.6.2
Part 7	Tree Based Methods, Decision Trees, Bagging, Random Forests, Boosting	ISL Ch.8.1-8.2
Part 8	Support Vector Machines	ISL Ch.9.1-9.4
Part 9	Unsupervised Learning: PCA & Clustering	ISL Ch.12.1-12.2, 12.4
Part 10	Nearest Neighbor Classifiers	Slides , Note , Video
Part 11	Linear & Softmax Classifiers	Slides , Note , Video
Part 12	Neural Networks & Backpropagation	Slides , Note , Video
Part 13	Convolutional Neural Networks	Slides , Note , Video
Part 14	Activation functions, data augmentation, weight initialization, learning rate	Slides , Note , Video
Part 15	Regularization, advanced optimization, batch norm	Slides , Note , batch norm , Video
Part 16	Recurrent Neural Networks	Slides (1 , 2), Note , Video (1 , 2)
Part 17	Attentions & Basics of Transformer	Slides , Video
비고 (참고 자료)	ISL : An Introduction to Statistical Learning, James, G., Witten, D., Hastie, T., & Tibshirani, R. (Available for free)	
	Neural Networks and Deep Learning (http://neuralnetworksanddeeplearning.com/)	
	ML/DL 수업 2022-1 학기 수업: eTL 복습을 위한 청강 신청 가능 / 답러닝 파트 영상링크	

Part 4: Database

	세부 주제 (Topic)	참고 자료 (Material)
Part 1	Database Design	Raghu 2-3, Hector 2-4
Part 2	SQL	Raghu 5, Hector 5-9
Part 3	STORAGE	Raghu 8-9, Hector 13
Part 4	Tree Index	Raghu 10, Hector 14
Part 5	Hashing	Raghu 11, Hector 14
Part 6	Query Processing	Raghu 12-15, Hector 15-16
Part 7	Transactions	Raghu 16-18, Hector 18-19
Part 8	Beyond RDBMS	강의 자료
비고 (참고 자료)	Overview document 문서 링크	