Silicon Valley University

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Course Syllabus

Course Title:	**Introduction to Machine Learning and Data Mining**
Instructor:	**Eugene Chang, Ph.D. (Email: eugene.chang@svuca.edu)**
Date:	May 15, 2015
Course Number:	CS596-029
Credit Hours:	3 credit hours
Course Length:	15 Weeks
Schedule:	Fri. 6:30pm - 9:30pm
Text Book:	**Machine Learning: An Algorithmic Perspective, Second Edition** by Stephen Marsland. **Publisher:** Chapman and Hall/CRC (October 8, 2014). **ISBN-10**: 1466583282. **ISBN-13**: 978-1466583283
Reference Book:	**Pattern Recognition and Machine Learning** by Christopher M. Bishop. **Publisher:** Springer (October 1, 2007). **ISBN-10:** 0387310738. **ISBN-13:** 978-0387310732 **Data Mining: Concepts and Techniques, Third Edition** by Jiawei Han et al. **Publisher:** Morgan Kaufmann (July 6, 2011). **ISBN-10:** 0123814790**. ISBN-13**: 978-0123814791
Course Description:	The course covers the fundamental concepts in Machine Learning theories, including Probability, Neural Networks, Bayes Estimate, Decision Trees, Support Vector Machine and Kernel Methods, Supervised and Unsupervised Learning, etc. The course also discusses applying machine learning techniques and Python programming to solve problems in data mining, bioinformatics, and object recognition.
Pre-Requisite:	***Graduate standing***
Co-Requisite:	None
Course Objectives:	Learning objectives of this course are: (a) Students will learn the fundamental concepts of Machine Learning theories and building blocks (b) Students will learn the Python programming language and libraries for scientific computing and machine learning (d) Students will learn the practical techniques and tools to solve domain-specific problems in data mining and object recognition
Learning Outcomes:	After completing this course, students will have the capabilities or skills indicated in the followings: (a) Concepts of Machine Learning theories (b) Python programming for scientific computing and machine learning (c) Techniques and tools to solve domain-specific problems

Course Outline (Subject to change)

Week	Topic	Reading/Homework/Case Assignment
1 (May 15)	Introduction, Python Tutorial	Ch. 1, Ch. 2
2	Math Primer, Linear Regression	Ch. 3, Class Notes
3	Decision Trees, SK-learn	Ch. 12 (HW-1)
4	Neural Networks	Ch. 3, Ch. 4, Ch. 5
5	Support Vector Machine, Kernel Methods	Ch. 8 (HW-2)
6	Probabilistic Learning and Ensemble Methods	Ch. 7, Ch. 13
7	Unsupervised Learning, Project Topics	Ch. 14 (HW-3)
8	Dimensionality Reduction, Midterm Review	Ch. 6
9 (July 10)	***Mid-Term Examination***	
10	Data Mining, Project Selection	Class Notes
11	Data Mining, Project Proposal	Class Notes, (HW-4)
12	Semi-Supervised Learning, Project Progress	Class Notes
13	Object Recognition, Project Progress	Class Notes
14	Bioinformatics, Project Progress	Class Notes
15 (Aug 21)	***Final Project Presentation***	

Instruction Methods: In Class Lectures

Grading:

30%	Midterm Examination
30%	Homework
40%	Projects
100%	Total

Grading Scale: Approximate letter grade range

90 <= A <= 100
80 <= B < 90
70 <= C < 80
60 <= D < 70
F < 60

Grading System:

Score Range	Grade	GPA
98 - 100	A+	4.3
92 - 97.9	A	4.0
90 - 91.9	A-	3.7
88 - 89.9	B+	3.3
82 - 87.9	B	3.0
80 - 81.9	B-	2.7
78 - 79.9	C+	2.3
72 - 77.9	C	2.0
70 - 71.9	C-	1.7
68 - 69.9	D+	1.3
62 - 67.9	D	1.0
60 -61.9	D-	0.7
Below 59.9	F	0.0

Honor Code:	All students taking courses in the SVU agree; individually and collectively, that they will neither give nor receive un-permitted aid in examination or other course work that is to be used by the instructor as a basis of grading.
Attendance:	Required.
Make-up Work:	No, unless pre-arranged with the instructor.
Resources:	All students are encouraged to use library-collected reference books and IEEE, ACM electronic Journals. You can also use ProQuest and ProQuest/ABI database for research and projects.
Revision Date:	05/15/2015