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9-2002

# CS 557.01: Machine Learning

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Opitz, David, "CS 557.01: Machine Learning" (2002). *Syllabi*. 2695.  
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# Course Syllabus

## CS457/CS557, Fall 2002

### Course Information

<b>Course</b>	CS 457 - Introduction to Machine Learning
	CS 557 - Machine Learning
Lecture Time	Monday, 5:10PM - 8:00PM
Lecture Room	SS344

<b>Professor</b>	David Opitz, PhD
Email	<a href="mailto:opitz@cs.umt.edu">opitz@cs.umt.edu</a>
Office	SS 417
Office Phone:	243-2831
Office Hours:	Monday 3:00PM-5:00PM
	Wednesday 12:00PM-2:00PM
	By Appointment
	Whenever my office door is open

<b>TA</b>	Abraham Konda
Email	ab_naveen@yahoo.com
Office	SS 306
Office Phone:	243-2059
Office Hours:	Tuesday 3:30PM-4:30PM
	Wednesday 3:30PM-4:30PM

### Course Objectives

Machine Learning is concerned with computer programs that automatically improve their performance through experience. Machine Learning methods have been applied to problems such as learning to drive an autonomous vehicle, learning to recognize human speech, learning to detect credit card fraud, and learning strategies for game playing. This course covers the primary approaches to machine learning from a variety of fields, including inductive inference of decision trees, neural networks, Bayesian learning, nearest neighbor, genetic algorithms, reinforcement learning, and data mining principles. The course will also cover theoretical concepts such as inductive bias and Occam's Razor.

A secondary objective of the course for CS 557 is to teach students how to conduct basic research. Therefore, each CS 557 student will conduct a project that is based on machine learning research at UM. Students may either pick from a group of proposed projects written by the instructor, or write a project proposal themselves.

## Topics and Readings

We will cover most of Chapters 1-6, 8, 9, 13. This will cover an introduction to concept learning, decision trees, neural networks, instance-based learning, genetic algorithms, Bayesian learning and reinforcement learning. If time allows, we will also discuss Chapters 11 and 12, which are analytical learning and hybrid approaches to learning. Supplemental material will be handed out as needed.

## Required Material

Tom M. Mitchell, Machine Learning, McGraw-Hill, 1997.

## Important Dates

Last day to drop/add by Dial Bear	<b>September 23, 2002</b>
Last day to drop/add (no \$\$\$ back)	<b>October 14, 2002</b>
Final Exam time slot	<b>Monday, Dec. 16, 2002 5:30PM-7:30PM</b>

Documentation must accompany requests for drops.

## Grading

	<b>CS 457</b>	<b>CS 557</b>
Midterm Exam	30%	25%
Final Exam	30%	25%
Homework	40%	30%
Project	0%	20%
<b>Total</b>	<b>100%</b>	<b>100%</b>

A grade of 90% or higher will ensure a minimum letter grade of A, 80% or higher a B, 70% or higher a C, and 60% or higher a D. These grade cutoff percentages may be lowered at the instructor's sole discretion; however, they will not be raised. For students taking a P/NP option, a letter grade of C or higher is required for a P.

## Prerequisites

The prerequisites for this course are one year of programming and one year of calculus. A student who takes this course without the prerequisites does so at his/her own risk. It is not the responsibility of the instructor to help a student gain the knowledge that he/she should have gotten by taking the prerequisites.

## Policies

- All assignments will be collected at the beginning of class on the due date. Late assignments will be penalized 20% per working day (handing homework in *after* the beginning of class on the *same* day will be considered one day late).
- I will not give exams early, and makeups will only be allowed under dire circumstances (e.g., severe illness or death in family). I *must* be informed in advance of the scheduled exam.
- Programming and homework assignments must be your own work. While you are encouraged to discuss general ideas with others in class, the work you hand in must be your own. If you are having difficulties, please see me. Duplication of work or plagiarism in any form is considered to be *cheating*, and will be dealt with in accordance with UM and Department guidelines.
- Profanity and/or obscenity will not be tolerated, either in class or on assignments.
- Students should notify the instructor of any disabilities at the beginning of the course.
- The policy on incompletes is as described in the University Catalog. Documentation must accompany requests for incompletes.