Symsys 15SI: The Theory and Design of Magic: The Gathering

Kevin: This is going to be so much fun!

Tom: More exciting than buying a '72 shagwagon

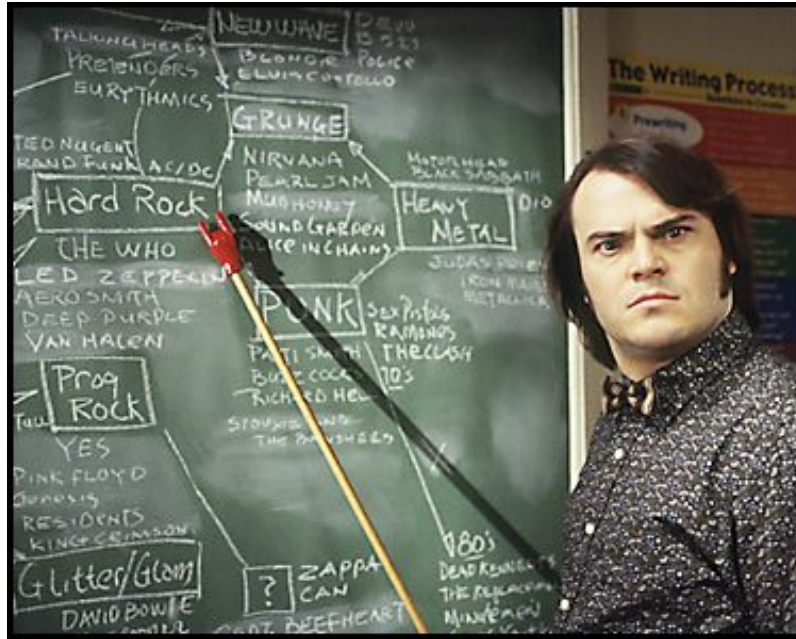# What is this class?

It's about Magic

This type of Magic

It's an application class

Nash Equilibrium

Minimax

Combinatorics

Kripke Structures

It's an overview of Symsys

A Science of the Mind

In the 17th century physics was a new frontier of science. In the 18th century chemistry had the same excitement. In the latter half of the 20th century, a new science has emerged. The same sense of adventure inspires some of the brightest minds to explore this new frontier: the study of symbolic systems.

Symbolic Systems attacks age-old questions about the relation between mind and the world, questions like the following. What is information? What is intelligence? How are they related? Is intelligence more than information processing? Does intelligence require a mind? For that matter, what is a mind? How are minds related to brains? Does intelligence require some sort of biologically-based brain? Or is it possible to create artifacts that process information in a way that we can call them intelligent?

What is the relation of mind to the external world? Is the world a creation of mind? Or does the mind explore and discover facts about an independently existing world? Or is the relation more subtle than either of these? What accounts for consciousness? And how does language and meaning fit into the picture? Does thought require language or other forms of representation, or vice versa? What is it that makes language meaningful? And what is the meaning that language is so full of?

These questions have puzzled thinkers for thousands of years. But beginning in the 1950s, scientists from a number of disciplines began to converge on a scientific approach to these puzzles.

Probably the most significant single factor in creating this new field was the development of the modern digital computer, dating back to work by the logician Alan Turing. Turing directly challenged the idea that thought and intelligence required a brain. He believed that it should be possible to create a machine that was capable of full-fledged thought. Although Turing's dream is far from realized, his work led to major steps in the development of the modern computer.

The computer has launched the study of mind, information, and intelligence into a new era in much the same way that Galileo's use of the telescope launched the new science of astronomy. By allowing us to build powerful simulations of various kinds of intelligent action, it provides a methodology for the rigorous probing of questions about the nature of mind, meaning, and intelligence.

But in the Symbolic Systems Program (SSP), the computer is more than just a tool for simulating the mind. It is part of the very subject matter of the field. Why? Because computer systems, robots, and people are all examples of symbolic systems, agents that use meaningful symbols to represent the world around them so as to communicate and generally act in the world. The notions of symbol, meaning, representation, information, and action are at the heart of the study of symbolic systems. This common core of notions arises in a variety of fields including artificial intelligence, computer science, cognitive psychology, linguistics, philosophy, and symbolic logic.

Who knows with this means?

It's way too much fun

So who do you think you are?

- Kevin Leung
  - self-declared genius of the "Tom's Room" environment
- Tom Medina
  - Kevin-declared griefer of the "Tom's Room" environment
- "Tom's Room" - Robinson 307
- 24-7 office hours

Card Types

- **There are seven types of cards:**
- Lands
- Creatures
- Instants
- Sorceries
- Enchantments
- Artifacts
- Planeswalkers

Basic Lands

Creatures

Air Elemental

3 🔵🔵

Creature — Elemental

M10

Flying

"The East Wind, an interloper in the dominions of Westerly Weather, is an impassive-faced tyrant with a sharp poniard held behind his back for a treacherous stab."
—Joseph Conrad, The Mirror of the Sea

Kev Walker

4/4

Runeclaw Bear

1 🟢

Creature — Bear

M10

Bears aren't always as strong and as mean as you imagine. Some are even stronger and meaner.

Jesper Ejsing

2/2

Elite Vanguard

Creature — Human Soldier

The vanguard is skilled at waging war alone. The enemy is often defeated before its reinforcements reach the front.

2/1

Mark Tedin

Child of Night

Creature — Vampire

Lifelink *(Damage dealt by this creature also causes you to gain that much life.)*

A vampire enacts vengeance on the entire world, claiming her debt two tiny pinpricks at a time.

2/1

Ash Wood

Llanowar Elves

G

Creature — Elf Druid

T: Add G to your mana pool.

One bone broken for every twig snapped underfoot.
—Llanowar penalty for trespassing

— Kev Walker

1/1

Kalonian Behemoth

5 G G

Creature — Beast

Shroud *(This creature can't be the target of spells or abilities.)*

"Do not fire upon it—it is bad luck. And a waste of arrows."
—Alera Benath, Kalonian ranger

— Daarken

9/9

Prodigal Pyromancer

2 🔴

Creature — Human Wizard

M10

🔴: Prodigal Pyromancer deals 1 damage to target creature or player.

"What am I looking at? Ashes, dead man."

Jeremy Jarvis

1/1

Nightmare

5 🔴

Creature — Nightmare Horse

M10

Flying

Nightmare's power and toughness are each equal to the number of Swamps you control.

The thunder of its hooves beats dreams into despair.

Carl Critchlow

★/★

Instants

Giant Growth — Instant — M10

Target creature gets +3/+3 until end of turn.

Matt Cavotta

Lightning Bolt — Instant — M10

Lightning Bolt deals 3 damage to target creature or player.

The sparkmage shrieked, calling on the rage of the storms of his youth. To his surprise, the sky responded with a fierce energy he'd never thought to see again.

Christopher Moeller

Cancel

1 💧 💧

Instant

M10

Counter target spell.

David Palumbo

Doom Blade

1 ⚫

Instant

M10

Destroy target nonblack creature.

The void is without substance but cuts like steel.

Chippy

Sorceries

Divination — 2💧 — Sorcery

Draw two cards.

"The key to unlocking this puzzle is within you."
—Doriel, mentor of Mistral Isle

Mind Rot — 2⚫ — Sorcery

Target player discards two cards.

"The beauty of mental attacks is that your victims never remember them."
—Volrath

Pyroclasm

1 R

Sorcery

Pyroclasm deals 2 damage to each creature.

"Who'd want to ignite things one at a time?"
—Chandra Nalaar

John Avon

M10

Rampant Growth

1 G

Sorcery

Search your library for a basic land card and put that card onto the battlefield tapped. Then shuffle your library.

Nature grows solutions to its problems.

Steven Belledin

M10

Enchantments - Global

Telepathy — Enchantment — M10

Your opponents play with their hands revealed.

"The most disappointing thing about learning telepathy is finding out how boring people really are."
—Teferi, fourth-level student

Matthew D. Wilson

Honor of the Pure — 1W — Enchantment — M10

White creatures you control get +1/+1.

Together the soldiers were like a golden blade, cutting down their enemies and scarring the darkness.

Greg Staples

Enchantments – Local or Aura

Zones

- There are 6 different Zones:
- Library
- Hand
- Graveyard
- Battlefield (AKA "in play")
- Exiled
- Stack

Typical layout

(nonland) Battlefield

Graveyard   Library

Lands

How to start

- Shuffle libraries, cut, roll to go first
- Draw 7 cards
  - if you don't like it, re-shuffle to 6 (mulligan)
- First player does not draw
  - Second player does
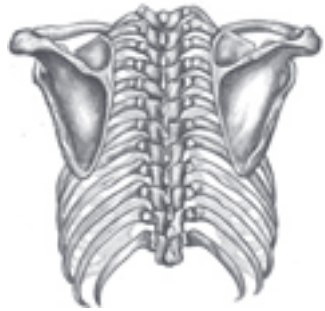
Anatomy of a Turn
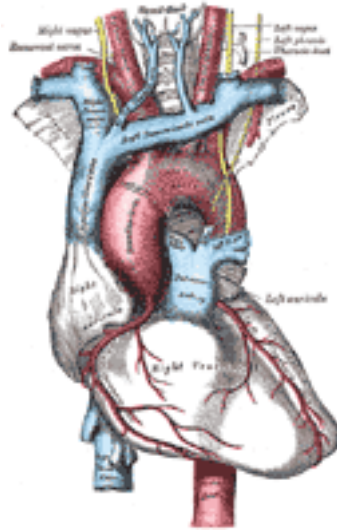
Untap

Untap all permanents unless something says otherwise.

Upkeep

Draw

- You draw one card per turn
  - Unless you're going first
- You must draw a card
  - You lose if you cannot (ie library is empty)

Main Phase 1

- Can play your land for the turn
  - Can only play one land per turn
- Can cast sorceries, creatures, enchantments, artifacts, planeswalker
- Can cast instants as well, though also at other times

Combat Phase

- Pre-combat stop
- Declare Attackers
  - Tap the creature to attack
  - Creatures with summoning sickness can't attack
- Declare Blockers
- Combat Damage
  - Doesn't go on the stack anymore

Main Phase 2

- Same as Main Phase 1

End of Turn Step

- All damage is removed from creatures
- All end of turn effects end.
- Cleanup will continue to happen until there are no more triggers

Let's Play!

- Make sure you know how to shuffle
- Convention says your opponent cuts your decks after shuffling
- Pair up new and experienced players
  - Play open hands if you want
- Trade decks all you want
  - You're not committed to a deck yet
- Play only with the decks we've given you

Golden Rules of Magic

- 1. When the card and rules conflict the card always wins.

Exploration

Enchantment

You may play an additional land each turn.

The first explorers found Argoth a storehouse of natural wealth—towering forests grown over rich veins of ore.

Illus. Brian Snoddy

Paradox Haze

2 🌢

Enchantment — Aura

Enchant player

At the beginning of enchanted player's first upkeep each turn, that player gets an additional upkeep step after this step.

"Keep your pace steady through the haze, lest you step on the heels of your future self or trip the self a moment behind you."
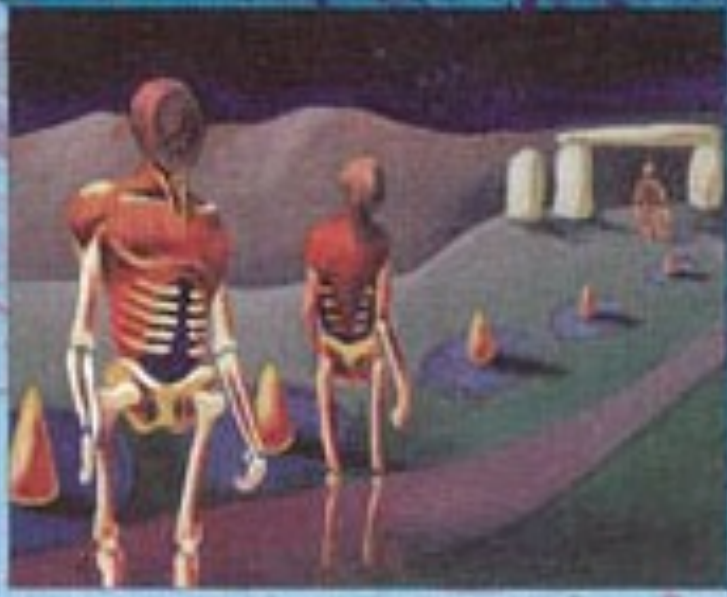—Teferi

Greg Staples

Golden Rules of Magic

- 1. When the card and rules conflict the card always wins.

- 2. When two cards conflict. Can't supersedes can.

Demonic Tutor

1 B

Sorcery

Search your library for a card and put that card into your hand. Then shuffle your library.

Liliana learned the secrets she sought, but at a price that was etched on her fate.

Scott Chou

Shadow of Doubt

U/B U/B

Instant

(U/B can be paid with either U or B.)
Players can't search libraries this turn.
Draw a card.

"Your ignorance is my bliss."
—Szadek

Greg Staples

The Stack

Cast Armorsmith

In response, he bolts

In response, you cancel

Cancel resolves
Bolt is countered

Armorsmith resolves

Nonbasic Lands

Karplusan Forest

Land

⊤: Add 1 to your mana pool.
⊤: Add 🔴 or 🌳 to your mana pool.
Karplusan Forest deals 1 damage to you.

—John Avon

Sunpetal Grove

Land

Sunpetal Grove enters the battlefield tapped unless you control a Forest or a Plains.

⊤: Add 🌳 or ☀ to your mana pool.

—Jason Chan

Pendelhaven

Legendary Land

⊤: Add 🌳 to your mana pool.

⊤: Target 1/1 creature gets +1/+2 until end of turn.

"This is the forest primeval. The murmuring pines and the hemlocks . . . Stand like Druids of eld."
—Henry Wadsworth Longfellow, "Evangeline"

Terramorphic Expanse

Land

τ, Sacrifice Terramorphic Expanse: Search your library for a basic land card and put it onto the battlefield tapped. Then shuffle your library.

Dan Scutt

Polluted Delta

Land

τ, Pay 1 life, Sacrifice Polluted Delta: Search your library for an island or swamp card and put it into play. Then shuffle your library.

Illus. Rob Alexander

Artifacts

Spellbook — 0 — Artifact

You have no maximum hand size.

"Everything the wise woman learned she wrote in a book, and when the pages were black with ink, she took white ink and began again."
—Karn, silver golem

Howling Mine — 2 — Artifact

At the beginning of each player's draw step, if Howling Mine is untapped, that player draws an additional card.

The mine's riches never end, nor do the moans of the spirits doomed to haunt them.

Artifact Creatures

Artifact Equipment

Planeswalkers

Chandra Nalaar

3 R R

Planeswalker — Chandra

+1: Chandra Nalaar deals 1 damage to target player.

-X: Chandra Nalaar deals X damage to target creature.

-8: Chandra Nalaar deals 10 damage to target player and each creature he or she controls.

Aleksi Briclot

6

Liliana Vess

3 B B

Planeswalker — Liliana

+1: Target player discards a card.

-2: Search your library for a card, then shuffle your library and put that card on top of it.

-8: Put all creature cards in all graveyards onto the battlefield under your control.

Aleksi Briclot

5

M10 Rule Changes

1. Simultaneous mulligans
2. Terminology – battlefield, exile, cast, play, beginning of the end
3. Mana pool empties on steps, no mana burn
4. Token ownership
5. Combat Damage doesn't use the stack
   1. Ordering multiple blockers
6. Deathtouch
7. Lifelink

More specifics on rules

- summoning sickness affects creatures that you have not controlled since the beginning of upkeep
- can block a single creature with multiple creatures
  - attacking player chooses an order for assigning damage
- Protection from X
  - cannot be blocked, damaged, or targeted by a X
  - pay attention when cards say target and not; it matters!
- Mana abilities don't use the stack
- End of turn, cannot have more than 7 cards in hand

Even more specifics on rules

- costs are paid immediately

What are we going to talk about?

- Magic basics and deckbuilding
- Game Theory – Econ160
- Game Design – ?
- Statistics – Stats116, CS109, or equivalent
- Epistemic Logic – Phil150/Phil151
- Artificial Intelligence – CS121/CS221
- Who's done what?

Class Format

- 2 hour timeslot
- 1 hour lecture
  - Talking off slides
  - Supposed to be interactive
- 1 hour lab
  - Playing Magic
  - Deckbuilding

Card policy

- No outside cards
  - We dictate the environment
- Cards received at our tournaments and for asking questions will also be legal

Grading policy

- You MUST attend 8 of the 9 classes
  - Tell us if you're not coming, and we'll arrange for (likely worse) make-up work
- Must also complete a presentation and either
- 1200-1800 word write-up on that presentation
- OR
- an equivalent amount of weekly write-ups
- all based around the deck you build

Final presentation

- The class is all about the deck that you will build and present at the end

- 5 minute presentation

- Expected to show how you applied the given topics in building and playing your decks

Events

- Zendikar pre-release this weekend!
- Zendikar release next weekend
- class Zendikar booster draft tournament
  - I just spend $620 to get cards...
- End of quarter tournament
  - with prizes!

Contact Info and website

- website: http://symbsys15si.stanford.edu/
  - or, if the proxy server is down
  - http://stanford.edu/class/symbsys15si/
- symbsys15si-aut0910-staff@lists.stanford.edu
- Robinson 307
- come to office hours
  - we have diet soda and granola bars
  - we have *a lot* of diet soda and granola bars
- Talk to us right now if you need to get into the class