

# How to Play Gradus

## Setup

- Print out several kits from the pages below. Every player has one kit, and can change their kit between games.
- Players form two teams and gather on the two staircases. The game will take place on some of the lanes between the staircases. The number of lanes in play should be less than the size of each team.
- Set a pen and paper (or other counter) on each staircase for scorekeeping.

## Gameplay

- While on the staircase, you may enter any of the lanes at any time.
- While on a lane, you may only walk forward. You may not run, change lanes, or pass other players.
- Your kit provides a list of “powers,” which you use to overcome obstacles and support teammates.
- **Your goal is to reach the end of the lane.** If you do, score a point for your team. Then you can start over: regain any lost powers, walk to the bottom of the stairs, and return to your team’s side.
- Your team wins if you score the most points within the time limit.

## Powers and Opponents

- In general, you can use a power whenever the player in front of you uses a power. This can either be a teammate or your “opponent.”
- In each round of conflict with an opponent, do the following:
  1. Point to a power on your kit, and wait for your opponent to do the same.
  2. Reveal which power you selected.
  3. Resolve both powers simultaneously.
- **Powers marked with \* are “free actions.”** Interrupt with a free action whenever you want.
- If your opponent is deliberately stalling, you may count from ten seconds.

## Defeat

- When you lose all of your powers, you have to start over.
- To get your powers back, keep walking to the end of the lane (you may pass other players during this time), and restart as normal, but don’t score a point.

## Glossary

- **“Lose a power:”** If you lose a power, **fold the top of the page** so that your topmost power is lost. It will come back when you reach the end of the lane, or when you “regain a power.”
- **“Usable once:”** After using a power with this caveat, **fold the bottom of the page to cover it.** It cannot be restored with “regain a power” effects.
- **“Nearby player:”** Refers to a player directly before, behind, or beside you.
- **“Field:”** Refers to the type of a power. Different fields are represented by different icons.
- **“Predict your opponent’s power:”** This means you don’t have to choose your power until your opponent reveals theirs. If both players use this skill, the effects cancel each other.
- **“Rule:”** Special rules remain in play until you change opponents. Copies of the same rule are not allowed.

# Biology

## Parasitology



*Rule:* Once in the future, when your opponent reveals their power, you may force them to select a different one.

## Plasticity



Lose one power. Move to an adjacent lane, or move in front of an adjacent player.



## \*Mercury Resistance



If your opponent's power would make you lose several powers, you lose only one power.

## Hybridization



*Rule:* Nearby teammates'  or  powers may affect your opponent instead of their own.

## \*Dance Language



If your opponent walks toward you or changes lanes to become your opponent, you can predict their next power.

## Relative Abundance



Your opponent loses a power for each of your nearby teammates, but regains a power for each of their nearby teammates.



## Longevity



Return to the back of the lane.

## Media Culture



*Rule:* If a nearby teammate is using a  or  power, you may ignore it or have it take effect twice. Usable once.

# Chemistry

## Conformal Spraying

Your opponent and their nearby teammates lose a total of two powers, distributed in a way your opponent chooses.



## \*Induced Phase

If a nearby teammate has powers from multiple fields, they can use powers on your opponent instead of their own.



## Fluorescence Nanoscopy

*Rule:* Your opponent cannot be affected by their teammates' powers.



## Endiandric Cascade

Lose one power. A nearby player regains one power. *Rule:* Your powers do not belong to any field.



## Regioselectivity

A player nearby your opponent must walk forward if possible.



## \*Brown Carbon

When your opponent is defeated, regain one power.



## Molecular Dynamics

Your opponent loses one power. They can move you into an adjacent lane of your choice.



## Translation Theory



*Rule:* When a nearby player uses a power, it can be of any fields you choose. Usable once.



# Chemistry and Biology

## Organometallic



Rule: Your  powers also count as  powers.

## Transcriptional Regulation



Your opponent loses powers until the number of powers that remain is a multiple of 3.

## \*Lentivirus Delivery Vehicle



If your opponent introduces a special rule, they lose one power.


## Muscle Signal



Your opponent loses one power. If your opponent's power lets them change lanes, prevent this.

## Biomimicry



Use any  power which is usable by a nearby player. If you try to copy an opponent's power but it doesn't exist, Biomimicry does nothing.

## Transition Metal Complex



Your opponent loses one power. The power they're using is changed to a different field of your choice.

## \*Amphiphile



If your power would affect your opponent, you can affect the person behind you instead.

## Biodiversity Conservation



Rule: If a nearby teammate uses a power that's not normally in their kit, that power takes effect twice. Usable once.

# Computer Science 1

## **\*Permuted Congruential Generator**

If a player predicts your next power, they lose one power.



## **\*Parallel Language**

If the player in front of you changes lanes, move to the same lane.



## **Formative Evaluation**

Predict your opponent's power. Before they reveal it, guess one of the fields it uses. If you're correct, your opponent loses one power.



## **Autonomous Navigation**

The player behind or in front of you may choose to swap places with you.



## **Pair Programming**

If the player in front of you uses a  power, their opponent loses a power.



## **Game Development**

*Rule:* This rule does nothing, but it can be applied multiple times.



## **Abstract Interpretation**

Your opponent loses one power for every special rule in play. Remove all special rules.



## **Technologies of Taste**

*Rule:* Nearby teammates' powers cannot be predicted or ignored. Usable once.



# Computer Science 2

## \*Image Alignment



Move to an adjacent lane, as long as a player on the other team is facing you on that lane.

## Memory Management



If your opponent's power adds a special rule, they lose one power and their power is ignored. If your opponent's power removes a special rule, they lose two powers.



## \*Intrusion Detection



As a player walks past you on an adjacent lane, they lose one power.

## Language Processing



If your opponent is using a  or  power, they lose one power and you predict their next power.

## Conavigation



Swap places with a nearby teammate on another lane.

## Crowdsourced Query (there must be a teammate nearby your opponent)



Predict your opponent's next power. Your teammate's power affects your opponent instead of their own.

## Deduplication (your opponent must have more than one power)



Your opponent loses one power.

## Technology and Culture



Rule: Your  powers count as        powers. Usable once.

# Engineering 1

## **Contaminant Transport** (there must be a Rule in play)

Your opponent loses two powers.



## **\*Electrical Connector Assembly**

When you use a power on your opponent, you can affect one of their nearby teammates instead.



## **Polycrystalline**

Add the following rule to yourself or a nearby teammate. *Rule:* If you use a power with multiple fields, it cannot be ignored.



## **Tunable Membrane**

Choose a field. *Rule:* Your opponent is no longer affected by powers with that field.



## **\*Skew Tolerant**

You can move forward or backward.



## **Capillary Stream Break-Up**

If your opponent is causing you to lose a power, transfer the effect to a nearby player on another lane. *Rule:* You may not use this power.



## **Kalman Filtering**

Your opponent loses one power. *Rule:* Your opponent cannot be affected by players from other lanes.




## **\*Moral Emotions**

After revealing a power, you can decide not to use it. Regain two powers. Usable once.



# Engineering 2


**Motion Planning** (you must be near a teammate with a  power)



*Rule:* You and a nearby teammate gain the ability to move backward or swap places. You must stay next to each other or the rule will be removed.

**Graphene Sheet**



If your opponent is using a  power, ignore it. *Rule:* You can no longer use this power.

**Harmonic Excitation**



Remove a Rule from yourself or from a nearby player.




**Manufacturing Practice**



Choose a field. A nearby player acts like they were affected by a power from that field.



**\*Wear Resistance**



Ignore a , , or  power, unless your opponent used it.

**Collaborative Creativity**



A nearby  player uses a power immediately, OR the opponent of a nearby non- player loses a power.

**Recirculation Pump**



*Rule:* Until the next round, when a nearby teammate uses a power, you may immediately use that power yourself.

**Orchestral Training**



You, the teammates nearby you, and the teammates nearby them, can each use a power immediately. Usable once.



# Engineering 3

## Synthetic Aperture

Predict your opponent's next power. If you nullify it, your opponent loses one power.



## \*Collagen Sponge

If you lose several powers in one round, a nearby player regains one power at the end of the round.



## Pollution Tracking

*Rule:* Any power which introduces a new rule is nullified.



## Optical Coherence Microscopy (there must be no player behind your opponent)

Move to your opponent's location; your opponent must move backward. Predict your opponent's power.



## Data Vortex Switch

All nearby players may use a  power outside the normal turn order.




## Water Resonance

Your opponent loses a power. *Rule:* Your opponent cannot regain powers.



## Music Information Retrieval

If you're defeated on this round, the player behind you regains their  power.



## Work and Identity


*Rule:* When a teammate walks past you on another lane, they regain a power. Usable once.



# Mathematics 1

## Swarm Equilibrium



If your opponent uses a  power, they lose two powers and you predict their next power.

## \*Spatial Embedding



If a nearby player on another lane loses a power, they lose another power.

## \*Biquandle



A nearby player must move in front of you, if possible.


## \*Fibonomial



If you lose one or two powers this round, lose them from the bottom of your kit instead of the top.



## Soliton



Your opponent loses one power. If they used a  power, they must use it again on the next round, or use nothing.

## \*Gromov-Witten Invariant



Ignore an opponent's  or  power. You cannot ignore the same field twice in a row.

## Holonomy (you must be near a teammate, who is near another teammate)



Lose a power. All three of you predict your respective opponent's next power. One of you moves to an adjacent lane.

## Entrepreneurship



Move backward as far as you can. Every teammate you pass on adjacent lanes may choose to move to your lane. Usable once.

# Mathematics 2

## Delay Differential Equation



*Rule:* When the next round is resolved, your opponent will lose two powers.

## Shape Space Metric



*Rule:* If the player in front of you loses two powers in one round, they can move to an adjacent lane.

## Jones Polynomial (you must be nearby 2 players not on your team)



Swap places with a nearby player, if they're nearby 2 players not on their team.

## Preperiodic Point



*Rule:* If your opponent uses the same power twice in a row, they lose one power.

## Fair Division



*Rule:* If you would lose or regain a power, you may transfer the effect to a nearby teammate. Also transfer the Fair Division rule to them.

## Polynomial Ideal



Regain all your powers and use one of them. Then lose all your powers.

## Quasi-Minimality



Your opponent loses one power. If there is a player behind you, your opponent's power affects them instead of you.

## Contact Zone




*Rule:* You and a nearby teammate can use powers from either of your kits. Usable once.

# Mathematical and Computational Biology

## Parsimony Reconciliation



Swap places with the player behind you. That player's next power counts as a  power.

## Thin Film Flow



The opponent of the player in front of you loses one power.

## Nonstationary Covariance



*Rule:* A nearby player may swap places with you as a free action.

## Phylogenetics



Use a nearby teammate's  ,  , or  power.



## Immunology



Your opponent loses one power. *Rule:* You cannot be affected by free actions (marked with a \*).

## Interdisciplinary Arts



Regain three powers. *Rule:* If a nearby player uses a power from two different fields, such as   , it takes effect twice. Usable once.

# Computer Science and Mathematics

## Aviation Security

If your opponent changes lanes this round, they lose two powers.



## Unbounded Fan-In (you must be behind a teammate with powers)

*Rule:* You occupy the same space as the teammate in front of you, and you share the same opponent.




## Homotopy (must have a nearby player on another lane)

Move to an adjacent lane. The nearby player moves to your original position.





## Flipped Classroom (you must have a nearby teammate with a different kit)

*Rule:* You and your teammate play for each other, each selecting the powers the other will use. You both cannot use  powers, but you can swap places as a free action.



## Elliptic PDE

A nearby teammate with  or  powers may use two powers this round, or swap places with you.



## Blue Noise

Your opponent loses one power. Blue Noise does not trigger any Rules in play.



## Letterpress Printing

*Rule:* Before your opponent's reveals a power, you may attempt to guess its title; if you're correct, you may ignore that power's effects. Usable once.



# Physics 1

## High-Intensity Laser Light



Your opponent must choose whether to lose two powers or pass on the effect to the player behind them (if one exists.)

## Exchange Coupling



A nearby teammate on another lane acts as though your opponent is also their opponent.

## Anisotropy



Choose an adjacent lane. Your opponent cannot move to that lane or be affected by people on that lane.



## Accretion Flow (a player from each team must be on either side of you)



Both of these players move to adjacent lanes, if possible.

## Shubnikov-deHaas Oscillation (this must be your only usable power)



Swap places with a nearby player (not your opponent). Ignore your opponent's  or  power.

## Cosmology



Choose a field. *Rule:* When your opponent loses their last power from that field, they lose an additional two powers.

## Quantum Optics



The opponent of a nearby player loses a power. If the effect targets yourself, move to an adjacent lane.

## Formation of Radiology



*Rule:* If a nearby player uses two  or two  powers in a row, regain a power. Lose this power.

# Physics 2

## Crustal Deformation

Each player near your opponent must move to an adjacent lane, if possible.



## Quantum Communication

Ignore your opponent's power (unless it's ). You may not use Quantum Communication on the next round.



## \*High-Energy Collision (you must have no opponent)

Walk forward until you have an opponent. *Rule:* Your opponent cannot move unless moved by another player.



## \*Photovoltaic

If you and your opponent did not move in the last round, your next power cannot be ignored.



## \*Noncommutative Geometry

If your opponent moves backward, they lose a power.



## Colloid

Your opponent loses one power. Remove a Rule from play if possible.



## Giant Magnetoresistance

Your opponent is pushed backward. *Rule:* Other players cannot change your position until the next round.



## The Standard Model

*Rule:* Every non- power in your kit and your opponent's now belongs to a different field:



→ → → → → → → . Usable once.

# Core 1

## Battery

Your opponent loses one power. An nearby player's opponent loses one power.



## \*PID Control

If your opponent changes lanes, they lose one power.



## Continuity

Move backward until you're nearby a teammate, or at the beginning of the lane.



**Stokes' Theorem** (opponent must be surrounded by players on all four sides)

Your opponent loses two powers.



## Matrix Exponential

A nearby teammate's next power takes effect twice.



## Harmonic Motion

Move to your opponent's position: everyone in front of you is pushed back.




## Best Reciprocal Hit

Your opponent loses one power. If you would both be defeated simultaneously, do not lose any powers this round.



## Academic Writing

Use one of your opponent's  powers; your opponent chooses which one is used. Usable once.





## Core 2

### Crystallography (you must be surrounded on three sides)

Move to an adjacent lane.



### Probability Vector

Move to an adjacent lane of your opponent's choice.



### \*Time Dilation

If you just walked forward to your opponent, you may use two powers on the next round.



### Diagonalization

Each player nearby your opponent, but not behind them, loses one power.



### Spiral Point

The player behind you may move to an adjacent lane. Then your opponent may move to an adjacent lane.





### Direct Finite Automaton

On the next round, you can use two powers in a row.



### Conditional Probability

Your opponent loses one power. *Rule:* If your opponent is affected by an  or  power besides Conditional Probability, predict their next power.



### Critical Inquiry

*Rule:* You can move to adjacent lanes even when another player is in the way: they move to a nearby location of their choice, possibly your original location. Usable once.



# Humanities, Social Sciences, and the Arts

## Choral Conducting



Move to an adjacent lane, then move to the back of that lane while passing other players. The first teammate you pass may use a power immediately.

## Creative Writing



You and every nearby player, including your opponent, may remove one Rule from play.

## Religious History



*Rule:* Copy a Rule which is used by a nearby player. Apply that rule to yourself or to a nearby player.

## Cultural History



*Rule:* When a power affects you, regain a power. Cultural History cannot be used on two powers which share a field.

## Gamelan (you must have already used Cultural Geography)



Every nearby teammate regains powers, and every nearby opponent loses powers, until they have 1, 2, 4, or 8 remaining. Usable once.

## Cultural Geography



Regain a power for every nearby player with a different type of kit. (Kits like “Mathematics” and “Computer Science and Mathematics” are considered different types, but kits like “Engineering 1” and “Engineering 3” are considered the same type.) Usable once.

# Incomplete

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